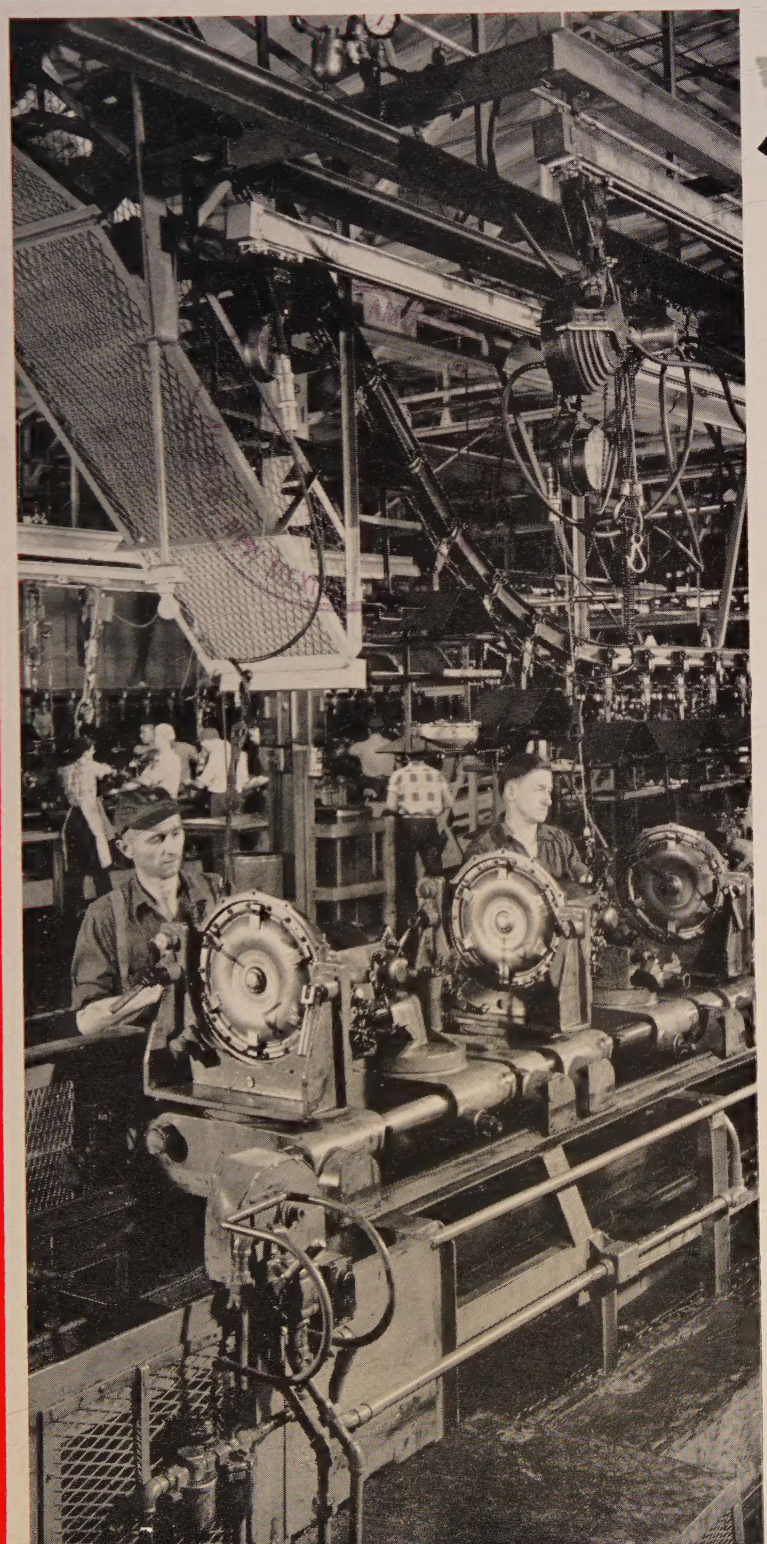
MAY 18, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING



Time To Cut Costs

Rising competition means you must search harder for excessive expenses. Where to look? See p. 58

✓ MORE EXECUTIVES QUIT
How To Cut Turnover, p. 47

✓ IMPROVED SURFACE FINISH
Look Under the Plate, p. 92

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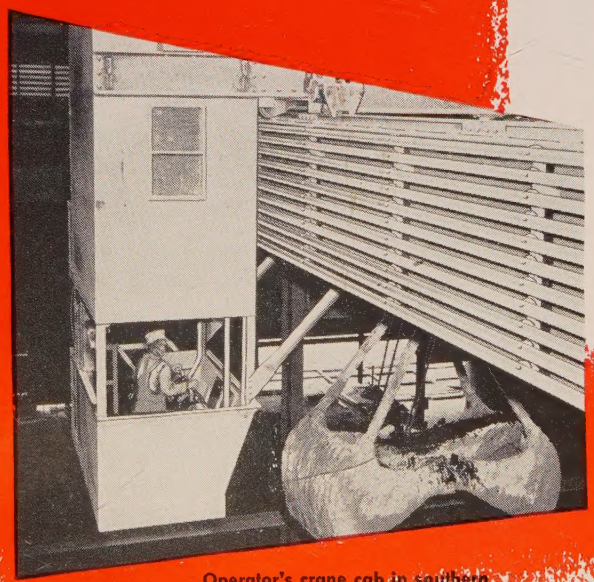
MASTER SWITCHES
for speed control

Operator's cab of river barge unloader



Operator's crane cab in southern fertilizer plant

EASY TO OPERATE
A BIG AID TO PRODUCTION

For sit-down, full view cabs or at stations where the operator stands up, several EC&M Master Switches can be compactly grouped within easy reach of the operator without the use of bell-cranks or chain-sprockets. Short in throw and narrow in width, these Cam Master Switches are less tiring on operators—the swifter, easier flow of output means more profit.

Individual speed point notches are readily felt with the off-point most noticeable. Inching between "off" and first point in either direction, too, is easy.

EC&M builds these Cam Master Switches with 2, 3 or 4 cams to provide ample circuits to suit the application.

MAKE YOUR OWN COMPACT LAYOUTS with EC&M Bulletin 1190 Cam Master Switches

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET • CLEVELAND 4, OHIO

95%

Of All Alloy Steel Jobs Can Be Handled With Standard Grades

Are you using special grades of alloy steel for jobs that can be done just as well with standard grades?

Applications, either military or civilian, that really justify the use of special steels are relatively few. And these are generally cases where resistance to heat, corrosion, and low-temperature impact are the main considerations.

In practically all other engineering applications AISI standard alloy steels will quench out to the desired hardness. One major advantage of standard grades is that chemical ranges generally fall within closer limits than those of other-than-standard grades.

Standard methods of heat-treatment can be used, and property ranges can be anticipated to a close degree. And when you adhere to standard grades, you will usually get faster delivery service; and your inventories will be lower, with less capital tied up in slower-moving special grades.

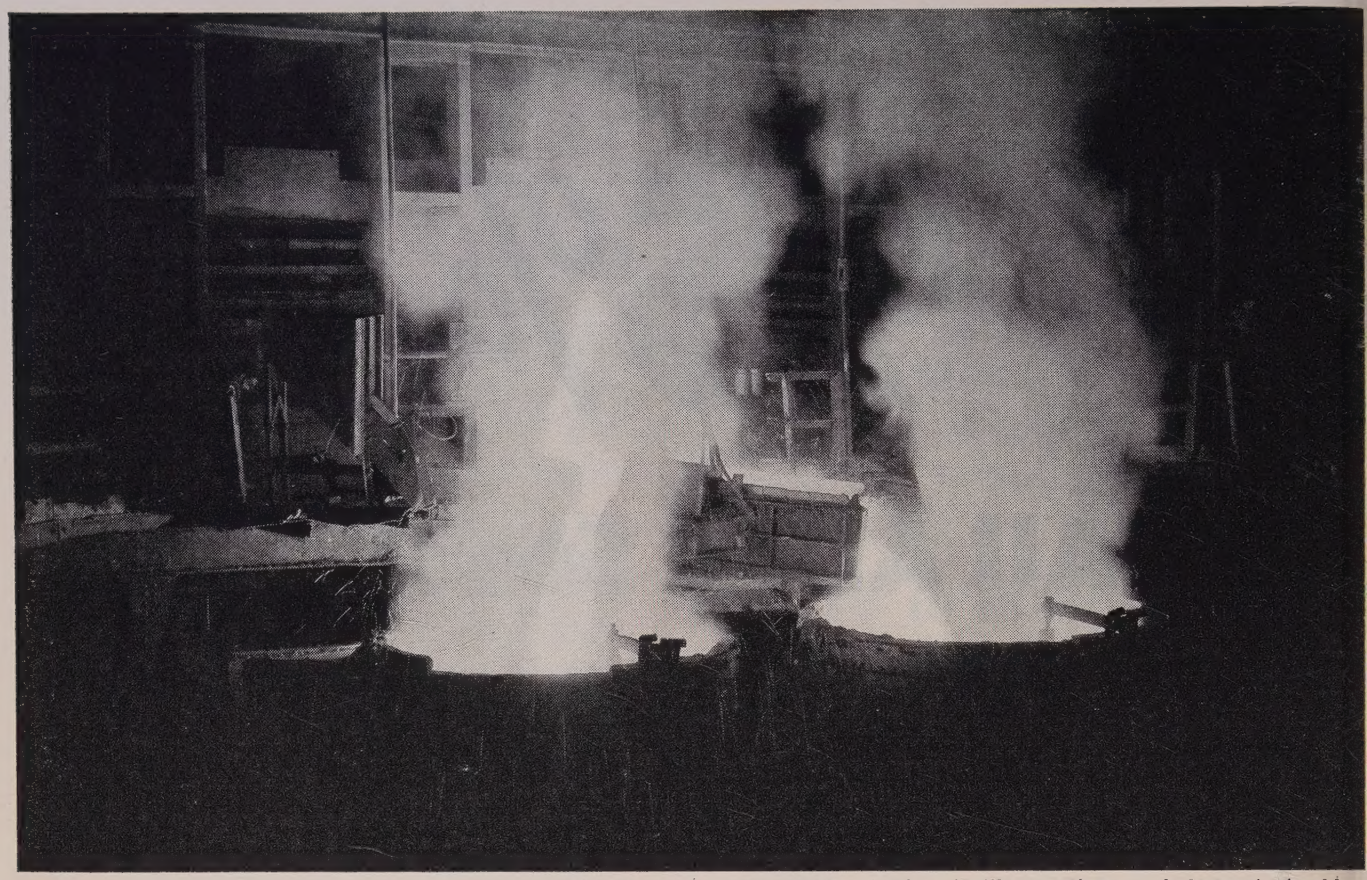
We at Bethlehem Steel manufacture and sell the entire range of AISI grades and special-analysis steels as well as all of the standard carbon steels. Our metallurgists are experienced in solving problems that pertain to all types of steel, and you can count on them for unbiased advice.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM ALLOY STEELS

BETHLEHEM STEEL



PHOENIX IRON & STEEL COMPANY, Phoenixville, Pa., is one of the nation's oldest steel producers. Above, Phoenix open hearth furnace being tapped by bazooka gun.

Steel, anyone?

Or, for that matter, aluminum, Fiberglas, magnesium?

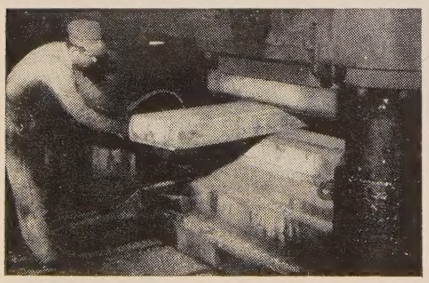
Name a basic material on industry's shopping list and chances are that one of Barium's 16 integrated companies has a hand in its production or fabrication.

No other steel producer fabricates so many different products. No other processor can match Barium's ability to turn magnesium, the versatile sea-born metal, into basic structural forms. Barium specialists are also breaking new ground in the utilization of Fiberglas for structural applications, such as aircraft shelters and barges.

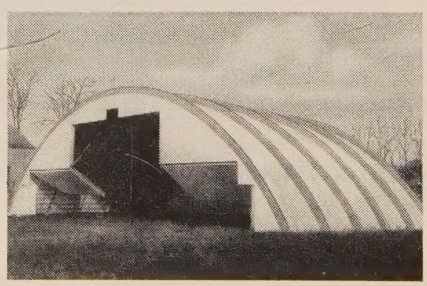
This close-knit and fully integrated organization of 16 companies offers you a wealth of top-rank engineering talent and extremely flexible production facilities. They can take excellent care of your requirements for structural and fabricated materials, whether routine or highly specialized. We'll be glad to tell you how. Just drop a line on your company letterhead direct to Barium Steel Corporation, 25 Broad Street, New York 4, N.Y.

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • EAST COAST AERONAUTICS, INC. • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. WILEY MANUFACTURING CO.

3.6



INDUSTRIAL FORGE & STEEL, INC., Canton, O., one of the nation's largest producers of heavy flat-die forgings, works in all types of steels and other metals. Here, titanium is being forged.



AT 60° BELOW, this air-borne Fiberglas-and-magnesium alert shelter protects planes and crews. Designed and built by Barium's East Coast Aeronautics, Inc., Pelham Manor, N.Y.

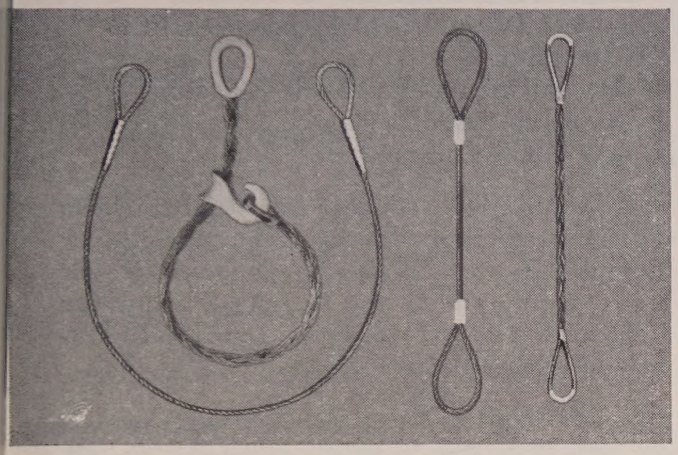
DOUBLE CHECK is given a radiator support for an Army truck by inspectors at Geometric Stamping Co., Cleveland, O., which turns out steel and aluminum stampings for industry.

PREFORMED INTERNALLY LUBRICATED

Wire Rope

for cranes, hoists, elevators, and all equipment

From Macwhyte's complete line of a thousand and one sizes and types, you get the right rope for your equipment. Thoroughly lubricated, PREformed, engineered to give long, low-cost service. *Send for Catalog G-15.*

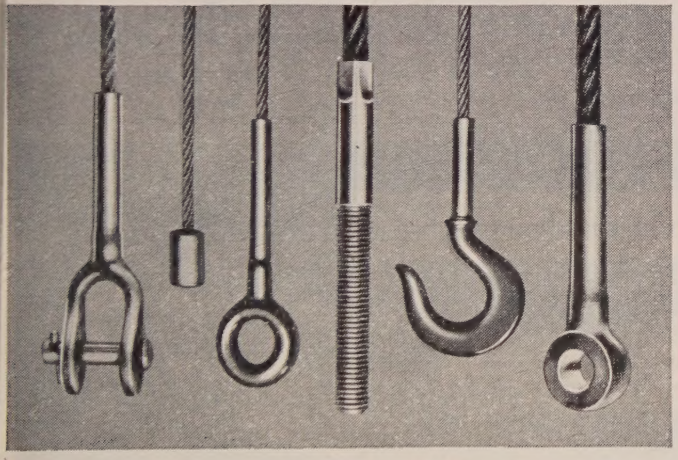


WIRE ROPE

Slings

for lifting and moving materials, equipment in production or maintenance

There are hundreds of types and sizes of Macwhyte Round-Braided, Flat-Braided, Single-Part, and Grommet Slings. All are custom made in length, capacity, and flexibility to meet your needs. *Send for Catalog S-8.*



WIRE ROPE

Assemblies

for machine parts, controls, and operating devices

Macwhyte Safe-Lock wire rope assemblies are made to order in length, strength, and flexibility desired. Terminals are permanently attached to one or both ends. There are many standard types. *Send for Catalog 5201.*

MACWHYTE

1028-SW

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IF IT'S A STEEL BELT—BE SURE IT'S A GOODYEAR

No other V-Belt gives you so many advantages

SINCE their introduction in 1942, Goodyear's Steel Cable V-Belt and Compass-V-Steel Belt have been the leaders in V-belt performance—offering advantages no other V-belt can match. Here's why:

The Goodyear steel-bodied V-Belt has its load-carrying steel cables placed parallel in the neutral plane of the belt. Every cable is uniform in length and tension—eliminating any possibility of a single cable being slack, wavy or out-of-plane. During and after manufacture, every belt is X-ray tested to be sure all cables share the load equally—with no "loafers" and no overworked cables.

That means these advantages on your drives:

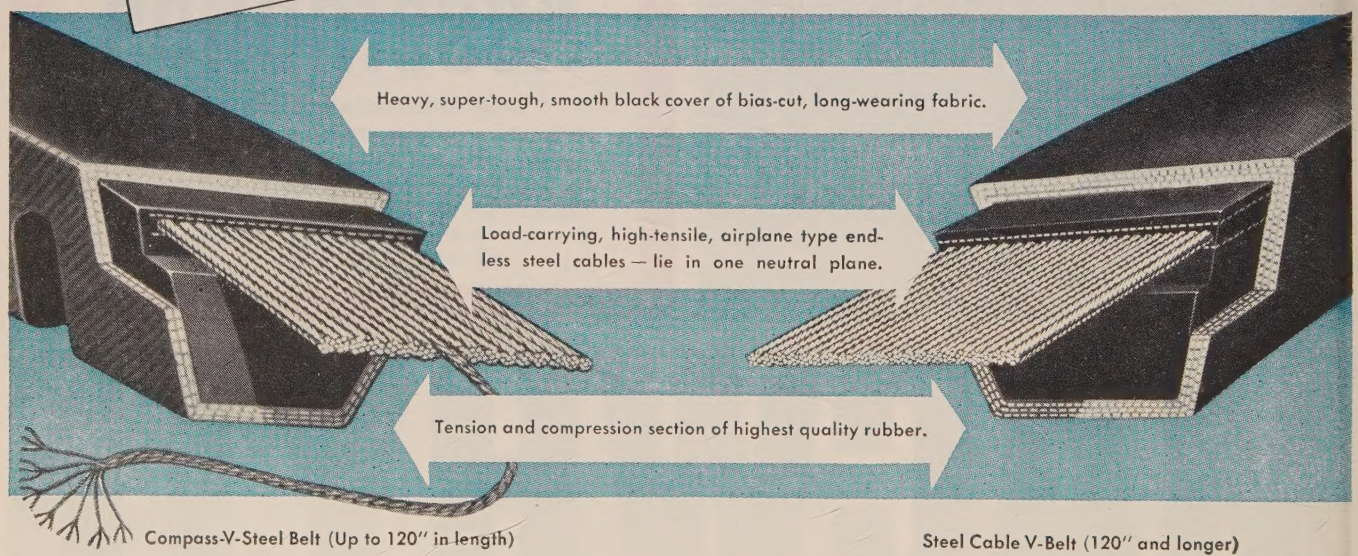
- Minimum Maintenance Requirements
- Highest Belt Efficiency
- Smooth Operations at Speeds from 10 to 10,000 fpm
- Greater Strength and Load Capacity
- Minimum Space Demands
- Low Power Consumption

Ask your nearest Goodyear Industrial Products Distributor about Steel Cable V-Belts or Compass-V-Steel Belts for your drives. Or write for details to the G.T.M.—Goodyear Technical Man—at Goodyear, Industrial Products Division, Akron 16, Ohio.

YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose (air, water, steam, oil, special), Belting (V-belts, transmission, conveyor, elevator), and other industrial rubber products. Look for him in your telephone directory under "Rubber Products" or "Rubber Goods."*

HERE'S THE INSIDE STORY

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio


Heavy, super-tough, smooth black cover of bias-cut, long-wearing fabric.
Load-carrying, high-tensile, airplane type endless steel cables — lie in one neutral plane.
Tension and compression section of highest quality rubber.

Compass-V-Steel Belt (Up to 120" in length)

Steel Cable V-Belt (120" and longer)

Available in standard or ORS construction; static-conducting when required.

GOODYEAR

THE GREATEST NAME IN RUBBER

This Week in Metalworking

STEEL

Vol. 132 No. 20 May 18, 1953

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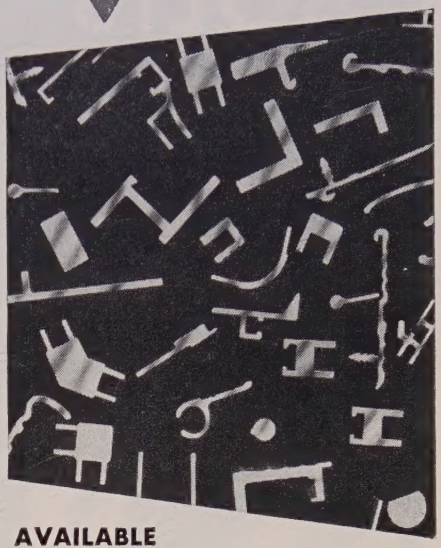
Over 4000 Standard

PE ALUMINUM EXTRUSIONS



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or Special Designs to fit your needs

Precision Extrusions catalogs over 4000 standard sizes and shapes of extruded aluminum rods, bars, shapes, and tubing, serving a wide variety of applications in transportation, architecture, and general industry. Or, if your product requirements call for a specially-designed extrusion, PE engineers will work with you in answering your problems of design, alloy-selection, and production.

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COMPLETE FACILITIES include design engineering, die making, billet casting, extrusion production, and standard finishing operations.

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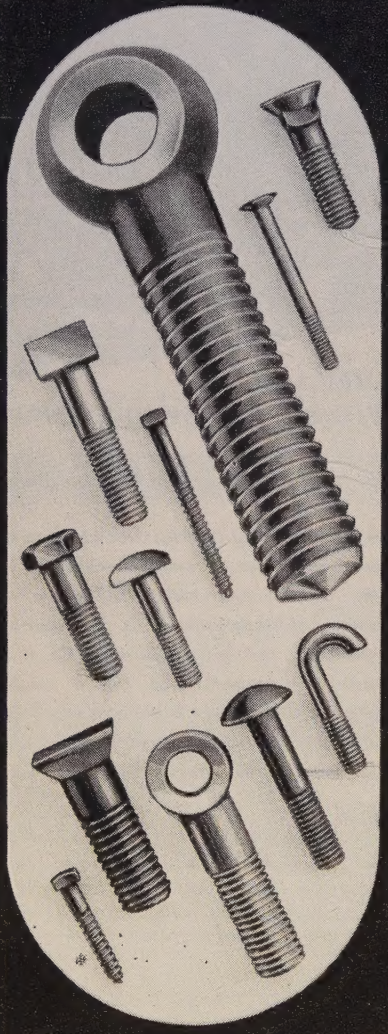
THREADED SPECIALTIES

EYE BOLTS

by an exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes ¼" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

PAWTUCKET

"THE BOLT MAN"

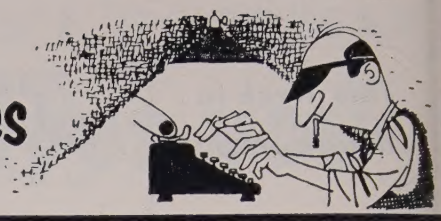
MANUFACTURING COMPANY

327 Pine Street · Pawtucket, R. I.

THE PLACE TO SOLVE YOUR BOLT PROBLEMS

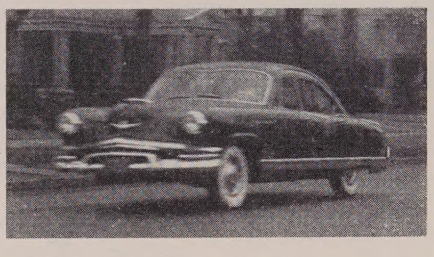
T.M. REG.

behind the scenes



Look Ma! Only Three Wheels

Living in an age when atom bombs, flying saucers and mechanical brains are common chit-chat for precocious plebeians, we thought nothing would ever surprise us. That is, until we saw this picture.



Marv Olson, district manager for New Equipment Digest, one of STEEL's sister publications, was making a call in Marion, Ohio. He had just stepped from his car when a bystander's cry called his attention to the three-wheeler rolling merrily down Main street. Camera-conscious Marv reached into his car, pulled out his Leica and caught this shot.

Inquiry into the "why's and wherefores" brought only the snide remarks that the whole deal was a publicity stunt to demonstrate Kaiser's "front wheel suspension".

Code of Ethics

As a reader of STEEL, we thought you would be interested in knowing what the Society of Business Magazine Editors stand for. We quote, therefore, the CODE OF ETHICS which guides each member of this association:

I believe in and seek to practice.

Editorial Accuracy. With reader interest as the paramount responsibility, I shall report objectively, facts as I find them . . . seeking always to lend strongest support to the business, profession or industry I serve.

Editorial Judgment. Because the publication of injudicious, unfair or untrue statements undermine honest business magazine editorial practice, I shall judge wisely the words I print.

Editorial Competitiveness. While I respect the rights of other editors and honor copyright privileges, I believe in full freedom of the press and in editorial initiative.

Editorial Service. My publication serves a fundamental purpose in stimulating the flow of goods and services . . . therefore, I direct my effort to building a fount of data for my readers. To them I devote the sum of my knowledge and the accumulated experience of the publication I edit.

Editorial Leadership. I shall endeavor to stimulate my readers to constructive thought and action on vital issues affecting them so that my magazine may bring enlightened leadership in its field.

A Ball-and-Chain Letter

One day last week we received what may turn out to be the greatest invention since Hadacol. This panacea came in the form of a letter which read as follows:

Dear Friend:

This chain letter was started by a man like yourself, in the hope that it might bring relief and happiness to tired businessmen.

Unlike most chain letters this does not cost anything. Simply send a copy of this letter to five of your businessmen friends who are equally tired. Then, bundle up your wife, and send her to the man whose name is at the top of the list, and add your name to the bottom of it.

When your name comes to the top of the list, you will receive 16,478 women and some of them will be dandies.

Have Faith—DO NOT BREAK THE CHAIN. One man broke the chain and got his old lady back.

P. S. As of this date of writing, a friend of mine received 183 women. They buried him yesterday and everyone said he had a smile on his face for the first time in years.

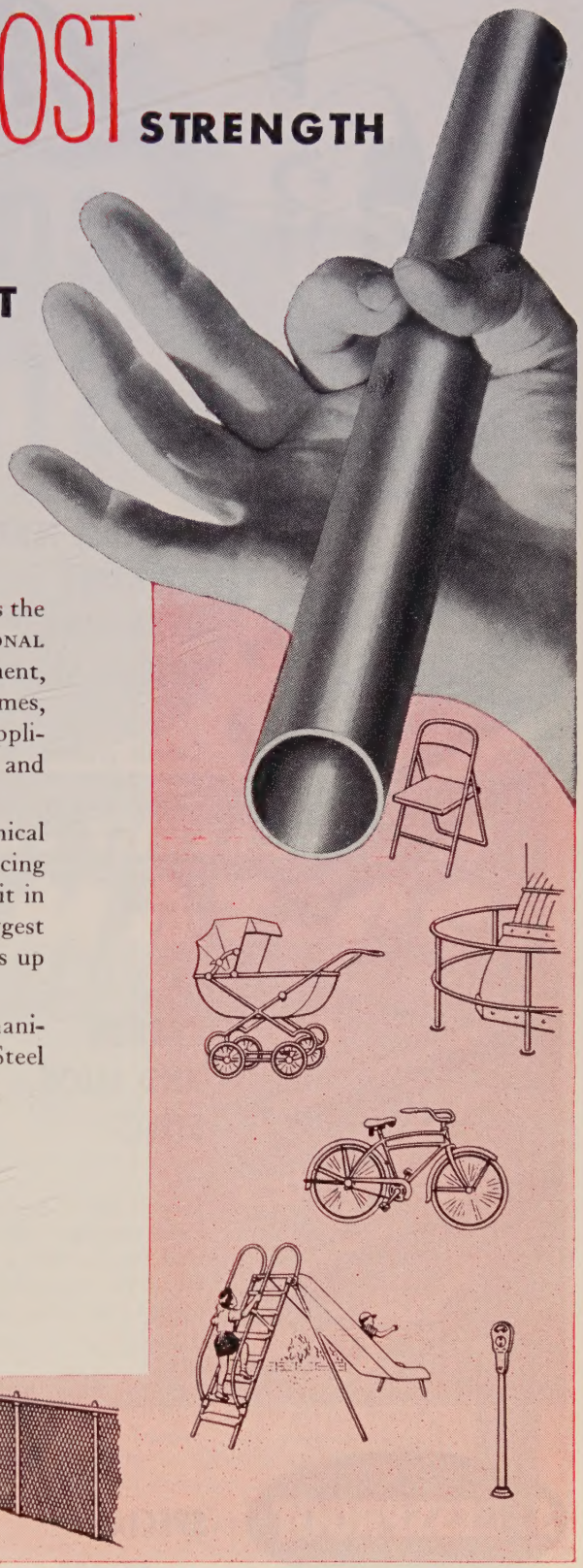
Anyone for letter writing?

Shrdlu

(Editorial Outlook—Page 39)

WHEN YOU WANT THE MOST STRENGTH WITH THE LEAST WEIGHT

USE A TUBE



• Why? Because, in proportion to size and weight, a tube is the *strongest structural form you can buy*. That's why NATIONAL Electric Welded Tubing is a natural for playground equipment, bicycles, baby carriages, lighting fixtures, furniture, seat frames, fence posts, guard rails, and hundreds of other mechanical applications, including automobile tail pipes, shot hole casing and flue tubes for water heaters.

If you are looking for a good commercial quality, mechanical steel tubing that will give you true economy without sacrificing quality and reliability in the finished product, you'll find it in NATIONAL Electric Welded Tubing. Made by the world's largest manufacturer of steel tubular goods, it is available in sizes up to and including 4″ O.D.

Send your inquiries for NATIONAL Electric Welded Mechanical Steel Tubing to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

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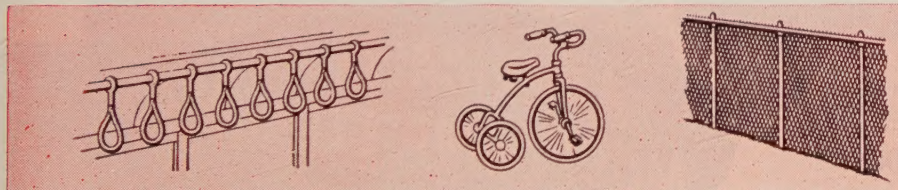
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(Tubing Specialties)
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



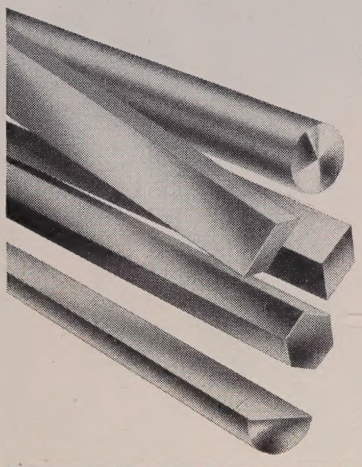
USS

NATIONAL Electric Welded MECHANICAL STEEL TUBING

UNITED STATES STEEL

La Salle MANUFACTURES QUALITY

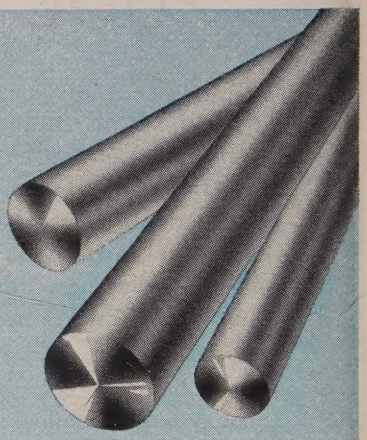
COLD FINISHED STEEL BARS . . .



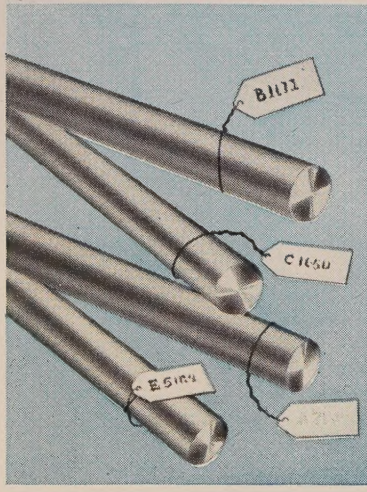
ROUNDS, FLATS, SQUARES, HEXAGONS, SPECIAL SHAPES

LaSalle produces a complete range of popular sizes, shapes, and lengths to fit your needs for economical production. Special shapes are produced to order.

COLD-DRAWN, GROUND AND POLISHED, TURNED AND POLISHED



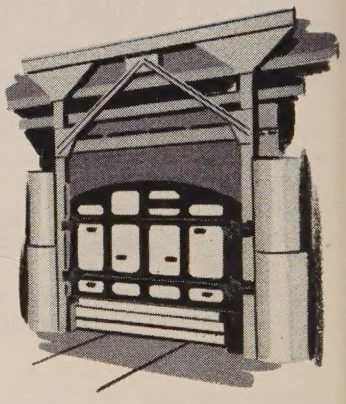
Modern equipment and skilled workmanship insure uniformity, strength, finish, and close tolerances.



CARBON AND ALLOY STEELS

It will pay to make LaSalle your first choice for cold finished bars in AISI and SAE steels in both carbon and alloy grades.

FURNACE TREATED STEELS



A complete battery of furnaces plus special drawing equipment make possible a wide range of fabricating methods and varied physical properties.

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SPECIAL STEELS

These include STRESSPROOF, with in-the-bar strength, wearability, machinability, and minimum warpage; and free machining LA-LED for better parts at lower costs.

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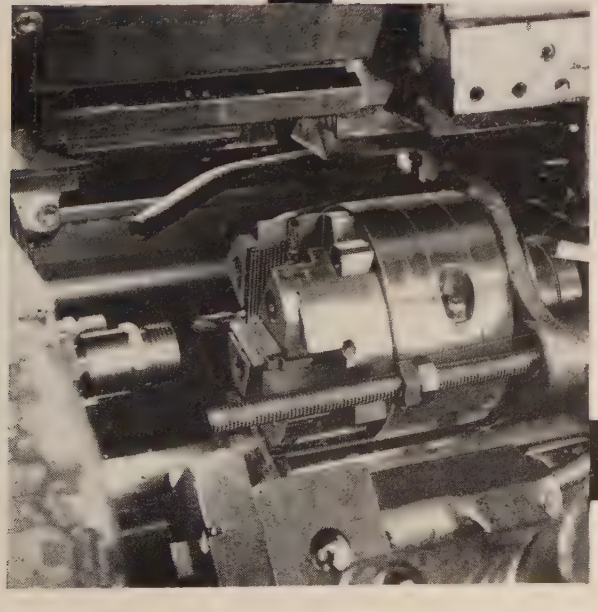
FOR EXTERNAL THREADING BY AUTOMATICS

LANDEX HEADS feature: WIDE RANGE— COMPACT DESIGN

A 1¼" JX LANDEX Head on a 1¾" Warner & Swasey Automatic is shown threading ¾" Press-Lock spuds. 1" Straight Pipe threads are cut on B-1113 steel, with an average of 3000 pieces threaded between chaser grinds. These spuds are one of the many types of industrial hose couplings and valves produced by the Dixon Valve and Coupling Company of Philadelphia.



The LANDEX is a yoke-operated head compactly designed for use on live-spindle machines where die head clearance is limited. They are built in ½", 13/16", 1¼", and 2" sizes, and each size will cut a wide range of thread diameters. For example, the 1¼" LANDEX shown will cut threads ¼" to 1¼" in diameter, and oversize chaser holders (available for all LANDEX JX Heads) will allow cutting thread diameters up to 2¾"

Write for Bulletin F-90.

LANDIS *Machine* CO.

WAYNESBORO • PENNSYLVANIA • U. S. A.

369

Give fire half a chance and it will over-run you like a swarm of ants.
You must stamp it out anywhere it shows itself.
In the paint locker, power plant, garage.
That calls for a battery of strategically placed KIDDE Portable Fire Extinguishers.

The word "Kidde" and the Kidde seal are trade-marks of Walter Kidde & Company, Inc. and its associated companies.

Get the ants out of your plants.
Call your KIDDE dealer today.

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LETTERS
TO THE EDITORS

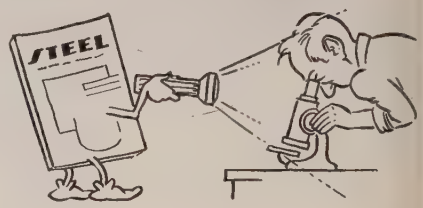
Aluminum Powder Producer

I am very much interested in your article "Metal Powders Grow" (Apr. 27, p. 49). In that article you state: "More aluminum powder sinterings are being used." Would you send me the name of any firm producing aluminum powder sinterings so that I may get in touch with them.

William C. Coyne
Swank Inc.
Attleboro, Mass.

• *Write to John Haertlein, research metallurgist, or J. F. Sachse, vice president, Metals Disintegrating Co., Elizabeth, N. J. A further point not mentioned in* STEEL*'s story of Apr. 27: Beautiful surface finishes can be achieved with aluminum powder compacts which require no finishing operation. If sinterings are anodized, they can be tinted with the same facility as aluminum parts made in any other fashion.—ED.*

Research Lights the Way



I have just looked over your story on research, "Recipe for Profit: Organized Research" (Apr. 27, p. 55). You have done a wonderful job in clarifying the function of research and its directions in the steel industry.

Your ideas ring a bell for me. Please let me have several tear sheets of the article so that I can show them around.

William J. Long
U. S. Steel Corp.
New York

. . . please send me two copies.

A. W. Gudal
Lukens Steel Co.
Coatesville, Pa.

• *Sent.—ED.*

Being a Better Neighbor

One of the members of our group called our attention to your article "How Industry Can Be a Better Neighbor" (Feb. 23, p. 53) and we would like to obtain 25 reprints.

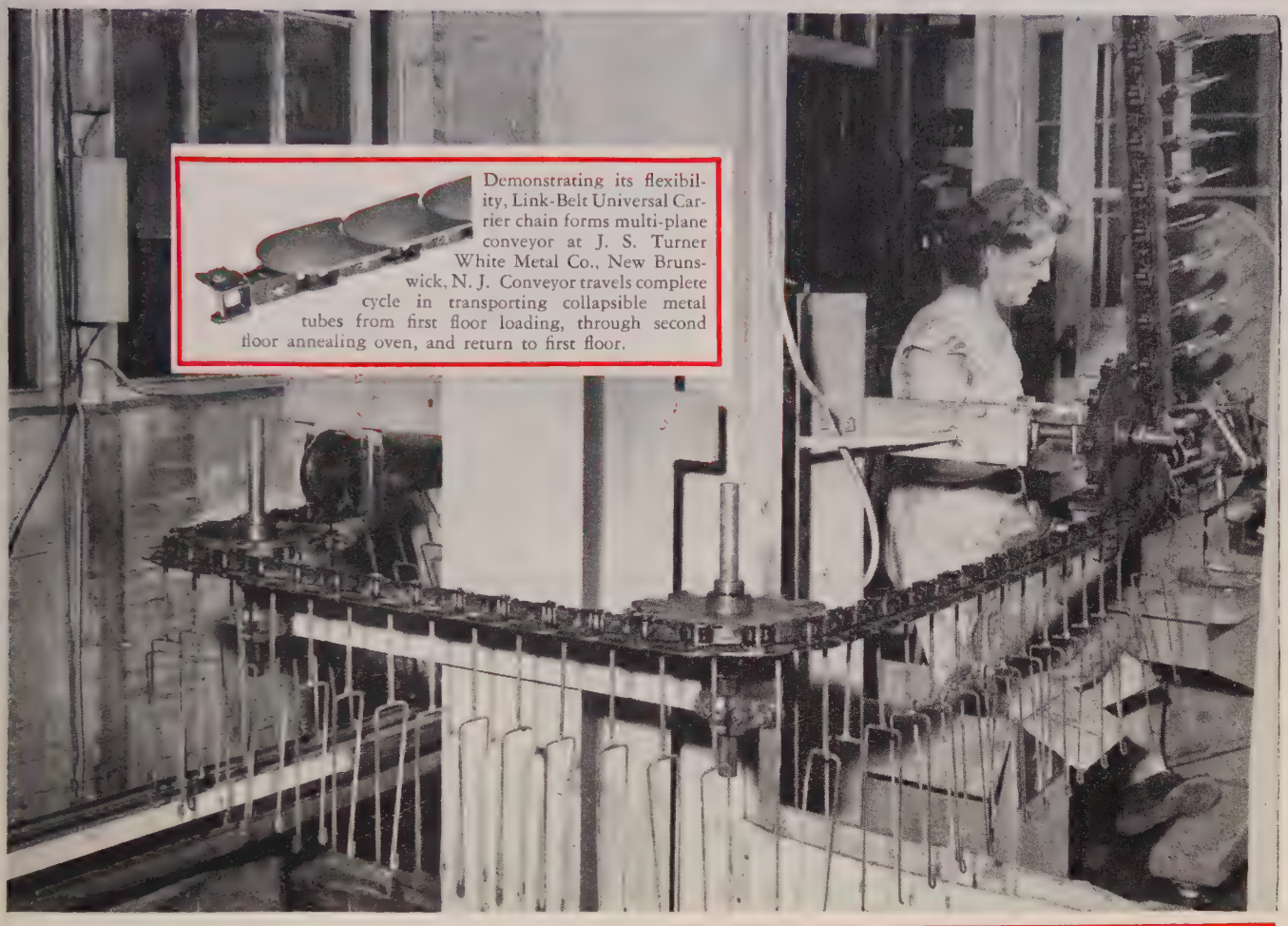
A. F. Moitoret
New York
secretary-treasurer
Public Relations Round Table of Seattle
Seattle

Far Eastern Thank You Note

We have the pleasure of informing you that we are in receipt of a letter

Please turn to page 12

Is there ONE chain that best meets your drive or conveyor problem?



Demonstrating its flexibility, Link-Belt Universal Carrier chain forms multi-plane conveyor at J. S. Turner White Metal Co., New Brunswick, N. J. Conveyor travels complete cycle in transporting collapsible metal tubes from first floor loading, through second floor annealing oven, and return to first floor.

You'll find the answer in LINK-BELT's complete chain line... a size and type for every job

The application shown above is an example of how you can select the *one* chain best suited for a particular need from the complete Link-Belt line. And each chain is engineered to provide more efficient service at lower cost than so-called general purpose chain.

Whatever your requirements, you are assured of the *right* chain for the job when you rely on Link-Belt. And, remember—a chain bearing the Link-Belt double arrow is your guarantee of longer chain life.

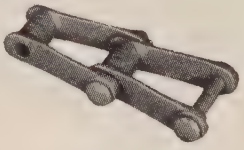
For information on the complete Link-Belt chain line, see the Link-Belt representative near you. He has the answers for efficient, low-cost drive and conveying chain performance.

LINK-BELT

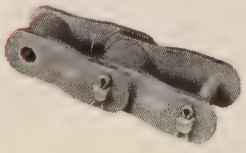
CHAINS AND SPROCKETS

Typical chains from the complete LINK-BELT line

Class C combination chain — popular, durable, low cost design for elevators, conveyors.



Class 400 Pintle Chain — Closed end design keeps out dirt, makes excellent service medium for drives, elevators, conveyors.



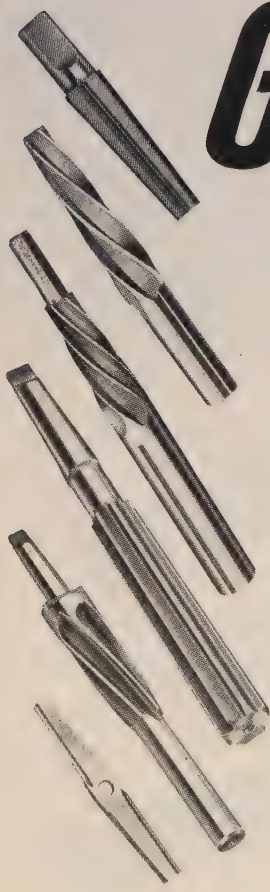
Class SS bushed roller chain with offset sidebars — for heavy drive service at moderate speeds.

Link-Belt Precision Steel Roller Chain, standard pitch, for high-speed drives or conveyors.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13,181-B

FOR SPECIAL REAMERS . . . REMEMBER

GORHAM



They may not *look* alike, but all of the special tools on this page share a common function . . . *because every one is a reamer!* Each was engineered and manufactured by Gorham Tool Company to provide a practical solution to a specific production machining problem for one of our customers.

Actually, these reamers represent just a few of the many special-purpose cutting tools produced by Gorham. Others include milling cutters and end mills, inserted blade cutters, flat and circular form tools, profile cutters, and carbide tipped tools of every description. Gorham "specials" are turning problems into profits in thousands of plants every day . . . and the one we engineer for you will solve *your* next production machining problem, too! Take advantage of our experience.

Your nearby Gorham Field Engineer is a qualified cutting tool expert in both practical design and actual application, and his assistance is yours without obligation. Just write for his name, or send details of your problem direct to us. We'll have him get in touch with you promptly.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

WEST COAST WAREHOUSE: 576 North Prairie Ave., Hawthorne, Calif.

LETTERS

Concluded from page 10

from Messrs. Hanson-Van Winkle-Munning Co., Matawan, N. J., which has been referred to Mr. William H. Sponwers, who received our letter by dint of your assistance.

We express, herewith, our sincere thanks for the trouble you have taken on our account about this matter. And we shall communicate with them on business for the future, as we could connect the above company with your great help.

Repeating our thanks for the trouble we are causing you.

We are, dear sir, yours truly.

S. Atsumo, president
Nikkosha Inc.
Tokyo, Japan

Analysis Gets Around

I have noted with interest your "Financial Analysis of the Steel Industry" (Apr. 20, opp. p. 74). I would very much appreciate your sending 200 reprints of this analysis to me.

R. Eberstadt, president
Barium Steel Corp.
New York

. . . we'd like to receive 15 reprints.

Joseph H. Jordan
U. S. Steel Corp.
Duluth, Minn.

. . . a number of people in our organization are interested in having a copy.

W. F. Hoelscher
secretary and assistant treasurer
Granite City Steel Co.
Granite City, Ill.

. . . kindly forward 15 copies.

E. D. Cayia
general auditor
Inland Steel Co.
Chicago

. . . would it be possible to get an additional copy?

Frank N. Hoffmann
legislative representative
United Steelworkers of America
Washington

. . . we would appreciate receiving 12 copies.

Roland W. Richards
vice president
Laclede Steel Co.
St. Louis

. . . this is your usual fine job and we would like to have 25 reprints for members of our staff.

S. D. Smoke
Hill & Knowlton Inc.
New York

• *Sent.—ED.*

Ways To Cut Titanium

We have read your Mar. 23 issue with interest and would like to have 100 copies of your article "Guideposts to Titanium Cutting" (pp. 76-79) by V. J. Gauthier.

W. E. Lusby Jr.
Specialty Products Section
E. I. du Pont de Nemours & Co. Inc.
Wilmington, Del.

. . . please send us 25 reprints.

D. W. Kaufmann
assistant sales manager
Rem-Cru Titanium Inc.
Midland, Pa.

. . . I am interested in securing a reprint of the article.

George J. Miller
Titan Metal Mfg. Co.
Bellefonte, Pa.

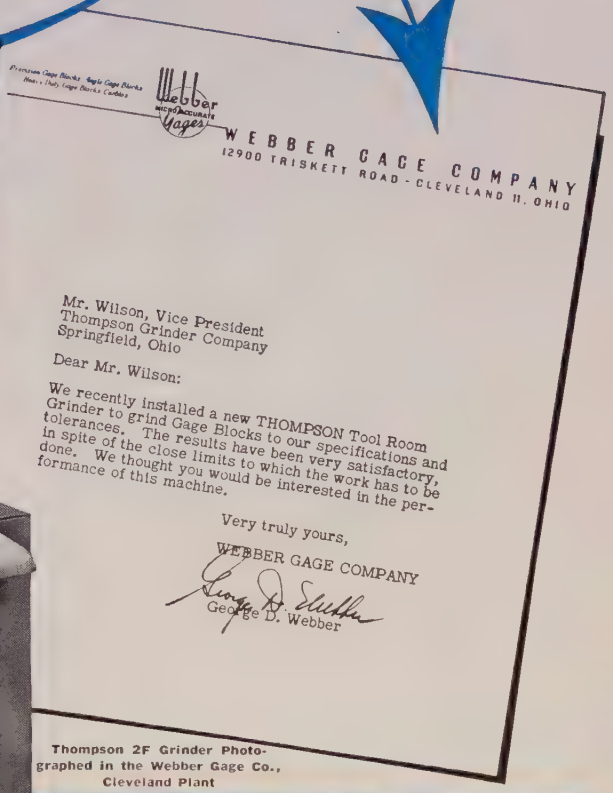
• *Sent.—ED.*

Here's Proof

The New Thompson Type 2F is a

SUPER PRECISION

Tool Room Grinder



WEBBER GAGE COMPANY
12900 TRISKETT ROAD - CLEVELAND 11, OHIO

Mr. Wilson, Vice President
Thompson Grinder Company
Springfield, Ohio

Dear Mr. Wilson:

We recently installed a new THOMPSON Tool Room Grinder to grind Gage Blocks to our specifications and tolerances. The results have been very satisfactory, in spite of the close limits to which the work has to be done. We thought you would be interested in the performance of this machine.

Very truly yours,
WEBBER GAGE COMPANY
George D. Webber

Thompson 2F Grinder Photographed in the Webber Gage Co., Cleveland Plant

COMPARE THIS NEW 8 x 10 x 24 TOOL ROOM GRINDER

When working to a tolerance of four millionths of an inch such as is observed when making Webber Gage Blocks, the rough or preliminary grinding plays an important role in keeping cost of the final finishing within reasonable limits.

Compare These Features:

- HARDENED AND GROUND cross slide ways completely sealed.
- One shot lubrication to cross slide ways and internal saddle bearings.
- HARDENED AND GROUND sealed anti-friction vertical slide.
- HARDENED AND GROUND BED WAYS with automatic lubrication.
- 3600/1800 R.P.M. 2 speed wheel head. Heavy alloy steel spindle heat treated, runs in super precision ball bearings accurately preloaded, lifetime lubricated.

Handy control panel.

- Elevation micrometer stop graduated in .0001".
- GROUND THREAD FEED SCREW.
- Automatic wheel TRUING device.
- Longitudinal hand wheel with automatic engagement.
- Hydraulic head movement throttle with rapid traverse.
- Hydraulic table movement throttle.
- Elevating hand wheel graduated in .0005".
- GROUND THREAD FEED SCREW.

WRITE TODAY for complete specifications and performance data. Address Dept. 10, Thompson Grinder Co., Springfield, Ohio.

The only manufacturer of a complete range of heavy duty and light duty surface and contour grinders for industry.

Thompson SURFACE Grinders

The Thompson Grinder Company, Springfield, Ohio

Here's the new.

LINDBERG CARBONITRIDING FURNACE

It's many-furnaces-in-one! • It's designed not only for carbonitriding . . but also for hardening, carburizing, annealing and carbon restoration! • It's a self-contained unit! • It's easy to maintain!

Change tubes like the blades in your razor! It's easy to change the new thin-wall tubes — just lift 'em out and hang new ones in place . . . all in a matter of minutes.

The greatest advance in industrial furnace design and construction since Lindberg introduced the Cyclone forced convection tempering furnace back in 1935!

A 320 lb. load of CRS sleeves. Carbonitrided .010 to .015". 90 minutes in heating chamber. Temperature, 1600° F.

A 400 lb. load of CRS hex nuts. Carbonitrided .001 to 005". 60 minutes in heating chamber. Temperature, 1600° F.

A 120 lb. load of CRS screws. Carbonitrided .005 to .008". 45 minutes total time...temperature, 1580° F.

...s, you must see the new Lindberg ...rbonitriding Furnace. It's many fur... ...ces in one . . . it's easy to maintain . . . ... a self-contained unit.

...Check these important construction ...tures . . . features that will improve ...oduction quality and volume, and ...duce production costs.

...any furnaces in one . . . Furnace ...mosphere is provided by the Lindberg "...yen" endothermic atmosphere gen... ...tor that is easily adjustable to supply ...ferent atmospheres not only for car... ...nitriding, but also for carburizing, ...rbon restoration, bright hardening or ...nealing and normalizing. For anneal... ...g and normalizing the heated charge ...ols in the same chamber used for ...rging.

...sy to maintain . . . Instead of old ...yle, heavy, unwieldly, horizontal radi... ...t tubes . . . new gas-fired, lightweight ...bes (only 29 pounds) are used. They're ...mple to change . . . turn off the gas . . . get on top the furnace . . . lift out the old tube . . . hang a new one in its place . . . and the thin, rolled metal tubes actually last longer!

Quench tank pit unnecessary . . . Your Lindberg Carbonitriding Furnace is self-contained, including a built-in pitless quench tank . . . thus you avoid costly excavation and piping. But more important, this built-in quench tank minimizes distortion . . . quenching takes place within the furnace structure, by means of a vertically operated elevator. Heated charges are never exposed to the air . . . as is the case when work is transferred from the heating chamber to a separate quench tank. Uniform case depth is assured because each charge automatically remains at heat the same length of time.

Purge chamber . . . A specially designed chamber, built immediately above the quench tank and in front of the heating chamber, receives work load for purging prior to heating.

For full details ask for Bulletin 241

Lindberg Engineering Company

2441 W. Hubbard Street, Chicago, Illinois

LINDBERG FURNACES

NOW you can

BRIGHT-ANNEAL STAINLESS

on a continuous production basis, with

The

SARGEANT & WILBUR

Controlled Atmosphere

CONVEYOR FURNACE

PARTS MADE OF STAINLESS can be

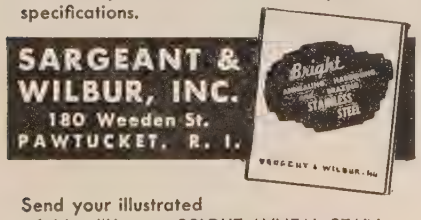
BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal; resists dulling; and the joint is practically invisible. *Gold and silver parts* are *soldered* in the same continuous-production furnace with equal success.

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a *conveyor furnace*, send us samples and specifications.



Send your illustrated folder "How to BRIGHT-ANNEAL STAINLESS in the S. & W. Conveyor Furnace."

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Company .....

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TIME-SAVING IDEAS

Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

NOW, FOUR TIMES THE SURFACE LIFE FOR THESE MILL ROLLS

Yet SUPERFINISH Achieves It In Half the Time

Where you have parts requiring the finest possible surface smoothness, Superfinish saves time and gives you better, longer wearing surfaces. You can bank on it!

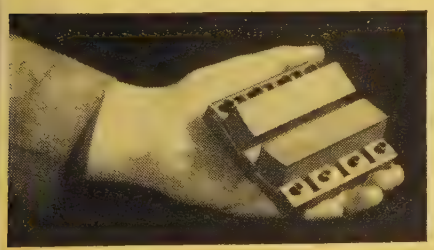
Here, Superfinish is at work in the steel industry—finishing mill rolls used for producing stainless steel strip. The machine, a Model 78 Mill Roll Superfinisher handles a variety of these rolls in a fully automatic cycle.

Here's how it saves:

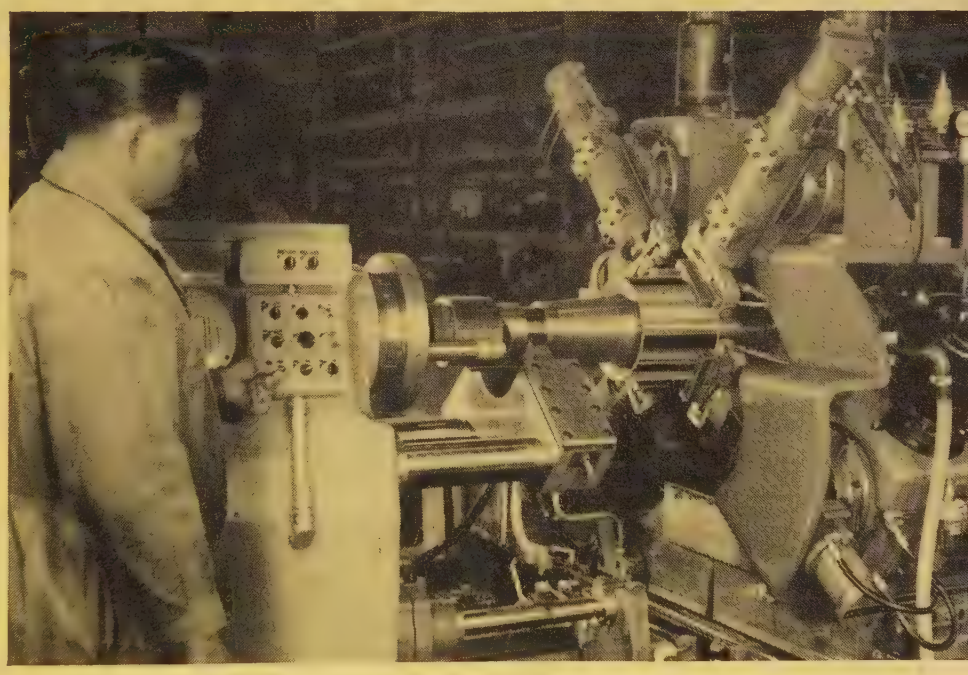
Finishing—Rolls are brought down from 15-20 to 1-2 micro inches RMS by Superfinishing. A roll 36 inches long by 20 inches in diameter requires just 15 minutes to finish . . . less than half the time for grinding.

Longer Life—The Superfinished surface is base metal, not the soft, annealed "smear metal" produced by grinding heat. Experience has proved that this harder, better wearing surface gives the rolls *more* than four times the service life of those finished by the old method.

Reduced Buffing—The Superfinished rolls leave a much finer surface and the stainless strip requires far less buffing to obtain the desired reflective surface.



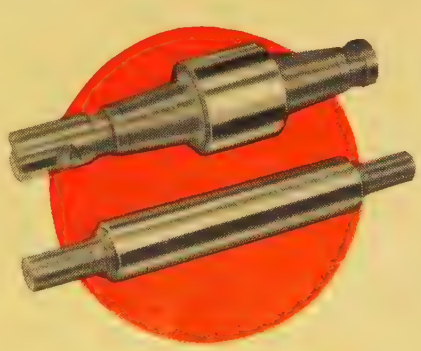
Quick-change stoneholder, with two Superfinishing stones, as used on each of four heads.



Superfinisher has fully automatic cycle. After loading, operator merely presses a button; the spindle then drives the roll, and the finishing heads move up to the work and begin oscillating.

These basic advantages of Superfinish—better, longer lasting surfaces that cost less—can be applied to your problems involving cylindrical surfaces. Ask for the reprint, "Mill Roll Superfinisher," which tells the complete story. We will also be glad to send you a free copy of the most authoritative textbook on this modern process, entitled, "Wear and Surface Finish."

Superfinishing gives these mill rolls smoother, longer lasting surfaces, and produces them in less than half the time required by grinding.

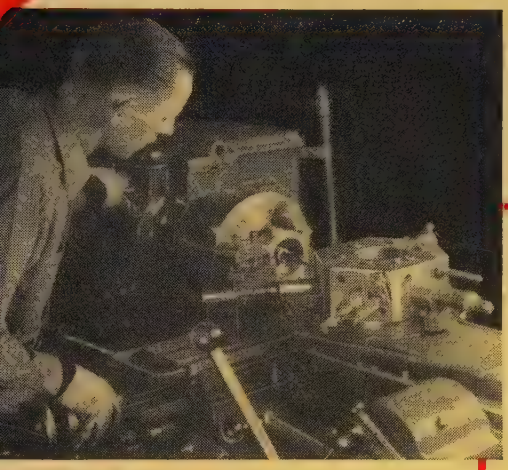


Roll surfaces finished to a smoothness of 1-2 micro inches RMS.

IDEAS LIKE THIS CAN INCREASE YOUR PRODUCTION

TIME-SAVING IDEAS

Many Surfaces Handled by Ram Type Lathe in One Chucking



First drilling operation on steam trap while facing from square turret.

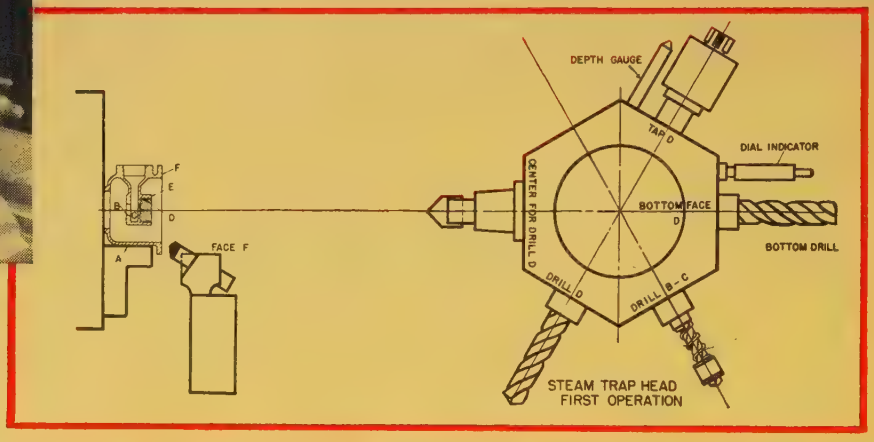
Careful planning shows up on these first operations for a steam trap head. A Gisholt No. 3 Ram Type Turret Lathe was selected for it because of the many surfaces that can be handled in one chucking.

For fast handling, an air-operated chuck is used. These are the operations: drill D, face F, drill B and C, bottom drill D to stop, and tap D while finish facing F. Time is less than 2.5 minutes, floor-to-floor.

To insure concentricity for B and C, the drill is supported with a bushing in D. Note the indicator to hold the depth of the bottom drill for D. This keeps the depth in perfect relation to face F. Interesting, also, is the depth gauge for D, which assures accurate tapping to the bottom of the hole.

When you plan your setup carefully like this around a fast machine like the No. 3 Ram Type Lathe, you're bound to get low-cost, high production every time.

Here, use of air chuck and combination tooling increases speed, while the indicator and depth gauge insure maximum accuracy.



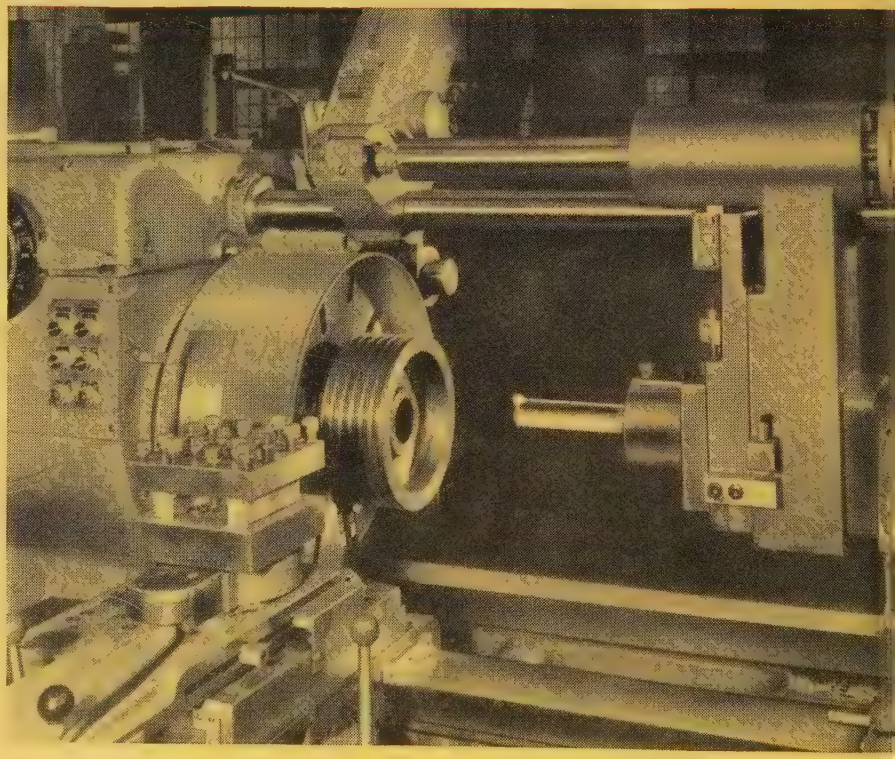
HERE'S HELP FOR SOME OF YOUR TRICKY BORING JOBS . . .

Special Unit on Saddle Type Lathe Handles Reverse Tapers or Special Contours

Here's an idea that can make boring operations easier. It's a special taper boring unit, mounted on a 3L Saddle Type Turret Lathe. In this case, conventional taper boring, it makes use of a stub boring bar, a slide tool and a special overhead pilot bar with milled slot holding a cam plate.

It works this way: As the turret carriage feeds forward, a cam follower on the slide tool rides along the cam plate. This guides the tool slide and boring bar along the angle of the cam plate . . . continuing *past* the cut before stopping. As the turret is retracted, the boring tool is held away from the finished surface to provide tool relief on the return stroke. When the tool is clear, it is automatically recocked for the next piece.

With this special attachment, fast, accurate bores, tapers and contours can be made without tool marks.

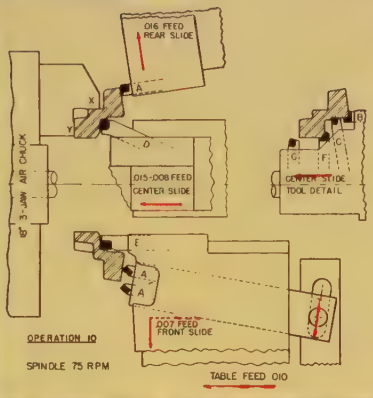


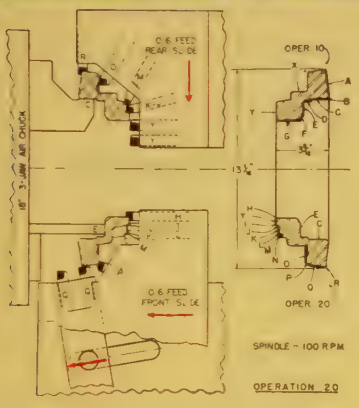
Special taper boring unit on fixed center 3L Saddle Type Turret Lathe

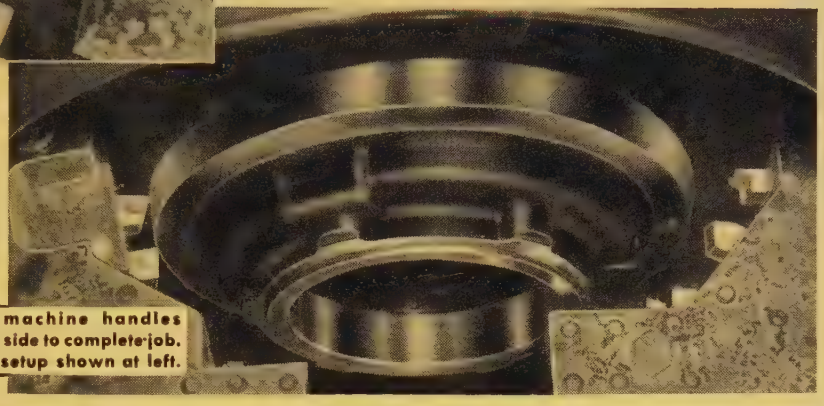
FAST TEAMWORK TO BEAT HIGH COSTS

Two Simplimatics and One Man Finish Parts in Jig Time

1st machine, showing workpiece and tooling (at right). Note many different directions of tool travel.







2nd machine handles other side to complete job. Tool setup shown at left.

It's simple ideas like this that frequently pay the biggest dividends.

By pairing up two Simplimatic Automatic Lathes with one operator, these bevel drive gears are produced in quick "one-two" sequence.

The first operation takes 5.0 minutes floor-to-floor. Rough and finish cuts on both straight and angular surfaces are done by front and rear slides while five tools on the center slide handle three diameters and two radii at the same time.

Time is 2.5 minutes floor-to-floor for the second operation. The rear slide faces the end, gear flange, chamfers, and rough turns two shoulder diameters. The front slide, operating longitudinally, finish sizes the two shoulders, corner rounds the bore and carries a sliding tool with cam block for rough and finishing the taper O.D.

Easily tooled to combine both straight and angular work of all kinds—the Simplimatic provides fully automatic operation, enabling one man to tend both machines. It's another example of the adaptability of the standard Simplimatics. New catalog shows many examples. Ask for it.

"TURN-ABOUT" GETS RESULTS WITH AWKWARD PARTS

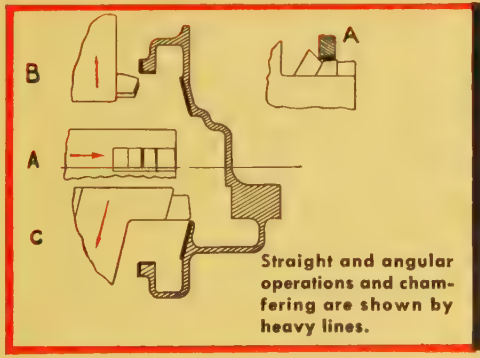
Chuck Holds Tools—The Slide Holds the Work—in this Novel No. 12 Hydraulic Lathe Job

See how good headwork and the No. 12 Hydraulic Automatic Lathe are paying off on this gear case job:

To do the awkward, jumbo-size part the usual way on a conventional turret lathe would have dictated an excessively large machine operating at slow speeds.

However, by turning the job around...and ingeniously mounting the tools on a rotating head and the gear case on a special longitudinal slide, the *work* feeds to the tools. Boring tools, mounted in a stub boring bar, do rough and finish boring and chamfering (A). Forward motion of the work-holding slide then stops and tool (B) faces outside surface. At the same time, tool (C) does angular surface—completing job in a single, automatic operation. Floor-to-floor time is just 1.7 minutes.

No. 12 Hydraulic Lathe with rotating tools (instead of work) shows way to real savings in machining time and costs ...and in machine investment and floor space.



Straight and angular operations and chamfering are shown by heavy lines.

Operator holds finished gear case. Note special holding fixture on longitudinal slide

HOW TO TURN A HARD JOB INTO AN EASY ONE

Ten Critical Surfaces Machined by Fastermatic... Automatically

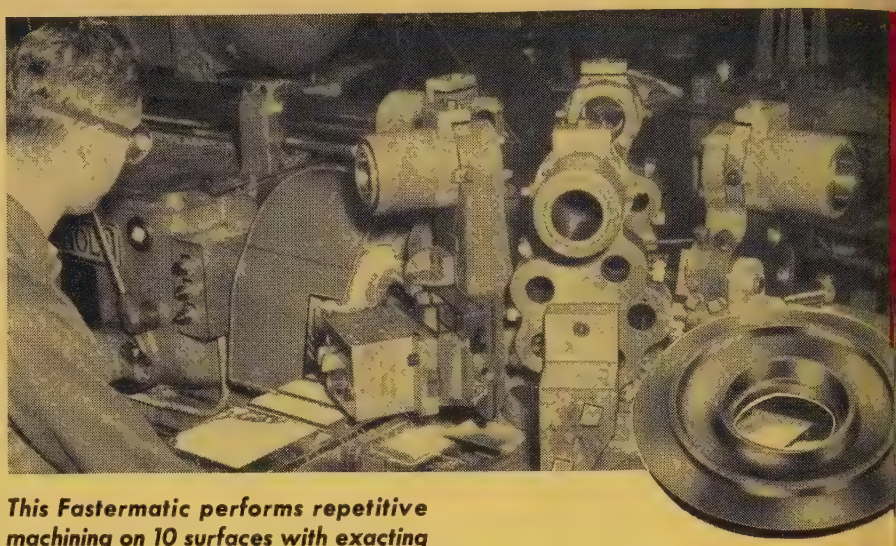
TIME-SAVING IDEAS

Here's the problem that faced this producer of 7" ball-bearing support rings for our jet program:

The material is difficult—alloy steel forgings of 40-41 Rockwell C. A large number of cuts are required—10 in all. And, close tolerances must be held.

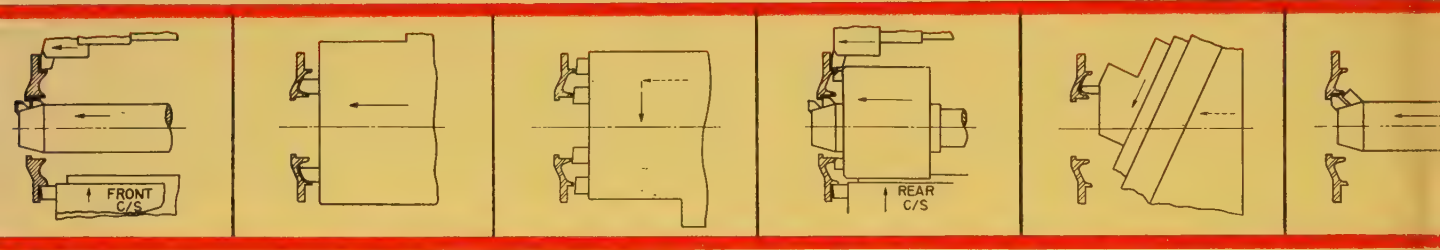
The combination of a 2F Fastermatic Automatic Turret Lathe and excellent tooling did the trick—with the entire job handled in one chucking.

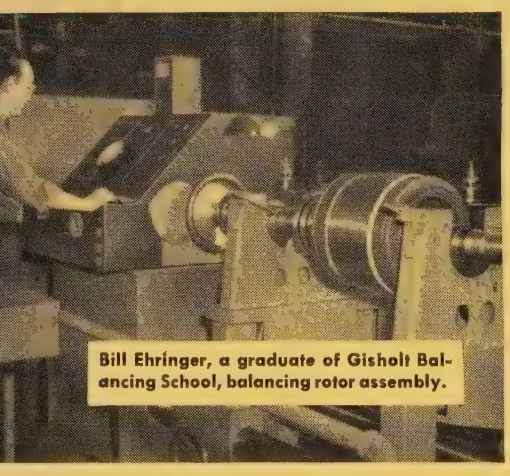
The drawings show how all six stations of the turret are used. Also, the front and rear independent cross slides. All roughing and finishing operations are completed in 4.5 minutes, floor-to-floor.



This Fastermatic performs repetitive machining on 10 surfaces with exacting precision...all in one simplified, automatic operation. All the operator does is load and unload.

Fastermatic setup for machining support rings.





Bill Ehringer, a graduate of Gisholt Balancing School, balancing rotor assembly.

BALANCING ADDS LIFE TO P&H CRANE MOTORS

Better Service Assured by Machine that Locates, Measures Unbalance

Uninterrupted service is a must with users of overhead cranes. "No service" can mean no production.

Harnischfeger Corporation, Milwaukee, leading manufacturer of cranes, goes all out to protect its customers...giving vital electrical components added "life insurance" by precision balancing.

The required correction on this 300 lb. rotor assembly is read directly from the meter on the Gisholt Type U DYNETRIC Balancer. With the amount and location of unbalance determined, a length of solder corresponding to the amount indicated on the machine is metered out and added to the banding wires—while the part is still in the machine.

The results? Increased service life of rotors and armatures, less maintenance, more efficient operation. The Balancer also handles couplings, clutches, fans, etc.

Unbalance in a variety of parts is located, measured and corrected—all without removing parts from machine.

DYNETRIC BALANCERS — GISHOLT — DEVELOPED JOINTLY WITH WESTINGHOUSE ELECTRIC CORPORATION "DYNETRIC" IS A TRADE MARK REG U S PAT OFFICE BY WESTINGHOUSE ELECTRIC CORPORATION

Ask for your copy of "Static and Dynamic Balancing." It has up-to-the-minute facts on balancing.

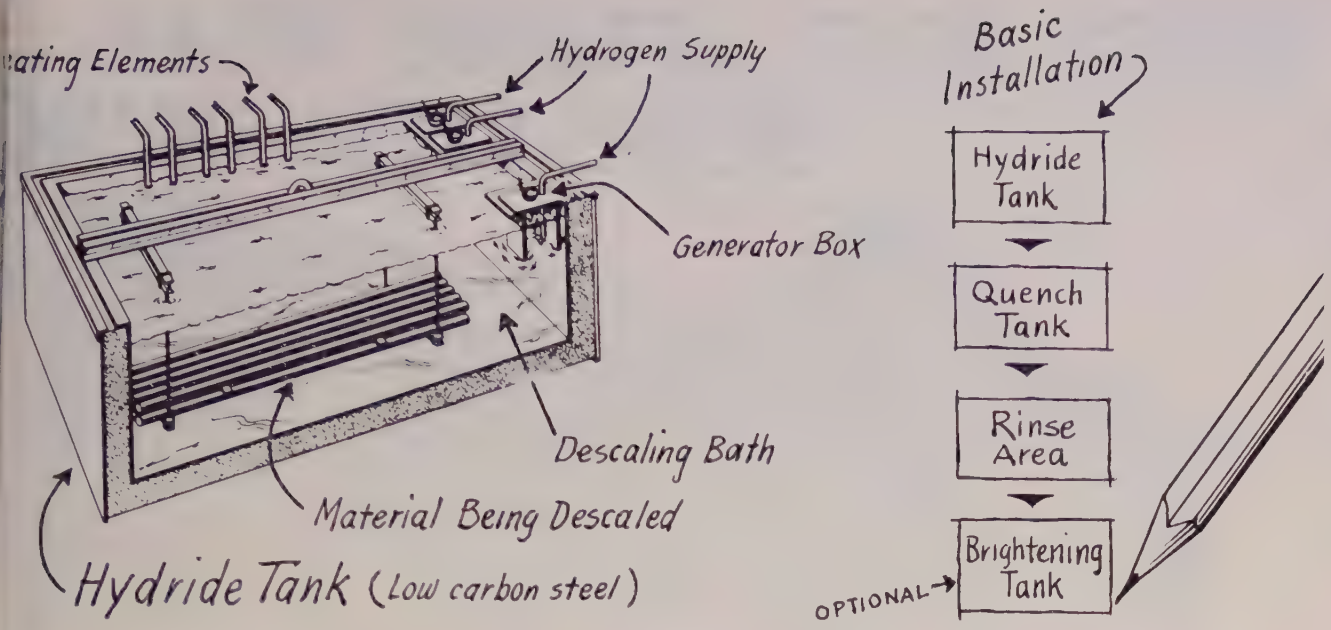
No. 5-653
608

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY

Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



Designed for simplicity of operation

DU PONT SODIUM HYDRIDE DESCALING PROCESS

The Du Pont Sodium Hydride Descaling Process uses simple, compact, low-cost equipment, and is so easy to operate that any pickler can be trained to run it effectively—within hours. Yet this remarkably efficient process is the fastest, most thorough descaling process in operation today! Just *one* treatment—including 15 seconds to 20 minutes in the hydride bath—is all it takes to completely clean a large volume and variety of work. And there is positively *no* danger of base metal attack—even if work is left unattended in the hydride bath *after* the descaling action is completed.

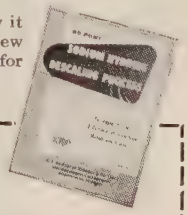
INVESTIGATE THIS MODERN METHOD OF DESCALING—You will probably find that you can improve your present descaling operations in many significant ways—and cut costs besides! Not only can you save the base metal that is pitted or etched away by other pickling methods, but your over-all cleaning procedure may be simplified. For example, sodium hydride descaling eliminates the need for any scale softening or breaking operations. By doing away with this step alone, there is a sizable saving in time, manpower and valuable floor space.

The flexibility of the sodium hydride process makes it adaptable to varied shop or production-line arrangements. Equipment can be manual, conveyorized or continuous—designed to meet your requirements.

GET THE FACTS FROM DU PONT—the pioneer of efficient descaling with sodium hydride. Let us show you how you can use the Du Pont process *profitably*. Just get in touch with our nearest district office or send in the coupon below.

DISTRICT AND SALES OFFICES: Baltimore • Boston • Charlotte • Chicago Cincinnati • Cleveland • Detroit • Kansas City* • Los Angeles • New York Philadelphia • Pittsburgh • San Francisco. *Barada & Page, Inc.

More detailed information about the process—how it works, what it can do for you—can be found in our new book. Call our nearest office or use the coupon below for your copy.



DU PONT
Sodium hydride process for positive descaling

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Wilmington 98, Delaware

Please send me more information about the Du Pont Sodium Hydride Descaling Process: advantages, applications, equipment used. I am interested in descaling_____

_____

*Name*_____ *Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

BEATS HEAT...STANDS WEAR...
KEEPS STEEL GOING

PENFLEX TUBING
PROVIDES FLEXIBILITY ON FUEL LINES...
RUGGEDNESS...DURABILITY...RESISTANCE TO HEAT

Connecting fuel and cooling lines on an open hearth take a constant beating. High heats . . . excess wear . . . fatiguing expansion and contraction.

One of the nation's largest steel mills solved the problem with two Penflex products — Penflex interlocked, flexible metal tubing and Penflexweld corrugated tubing, with braided wire covering. "Flexineering" applied the right tubing most efficiently, and more consistent production resulted.

Write for this helpful folder, "Flexineering" ...your guide for solving tubing problems.

Penflex flexible metal hose with couplings absorbs any pipe movement due to extreme temperatures and pressure changes. Provides outstanding safety and high uninterrupted flow of flammable materials. Leakproof, tough and flexible.

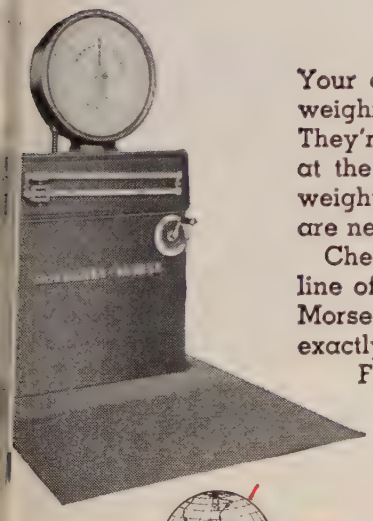
Penflex engineers can help you solve flexible tubing application problems. Penflex manufactures a complete line of four-wall, interlocking and seamless welded corrugated tubing . . . from ⅛" I. D. and up . . . automatic barrel fillers, accessories and fittings.

Pennsylvania Flexible Metallic Tubing Company, Inc., 7219 **Powers Lane, Phila. 42, Pa.**
Branch Sales Offices: **Boston • New York • Chicago • Houston • Cleveland • Los Angeles**

PENFLEX
HEART OF INDUSTRY'S LIFE LINES

Look to this dial

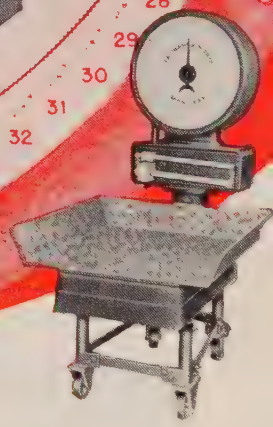
for speedy, accurate weighing!



Your advantage—speedy, sustained accuracy weighing with Fairbanks-Morse Dial Scales. They're designed for easiest reading . . . right at the point of the indicator, even with drop weights applied . . . no mental calculations are necessary.

Check the features of the Fairbanks-Morse line of Dial Scales with your local Fairbanks-Morse Weighing Expert—he'll have a scale to exactly suit your needs.

Fairbanks, Morse & Co., Chicago 5, Illinois.



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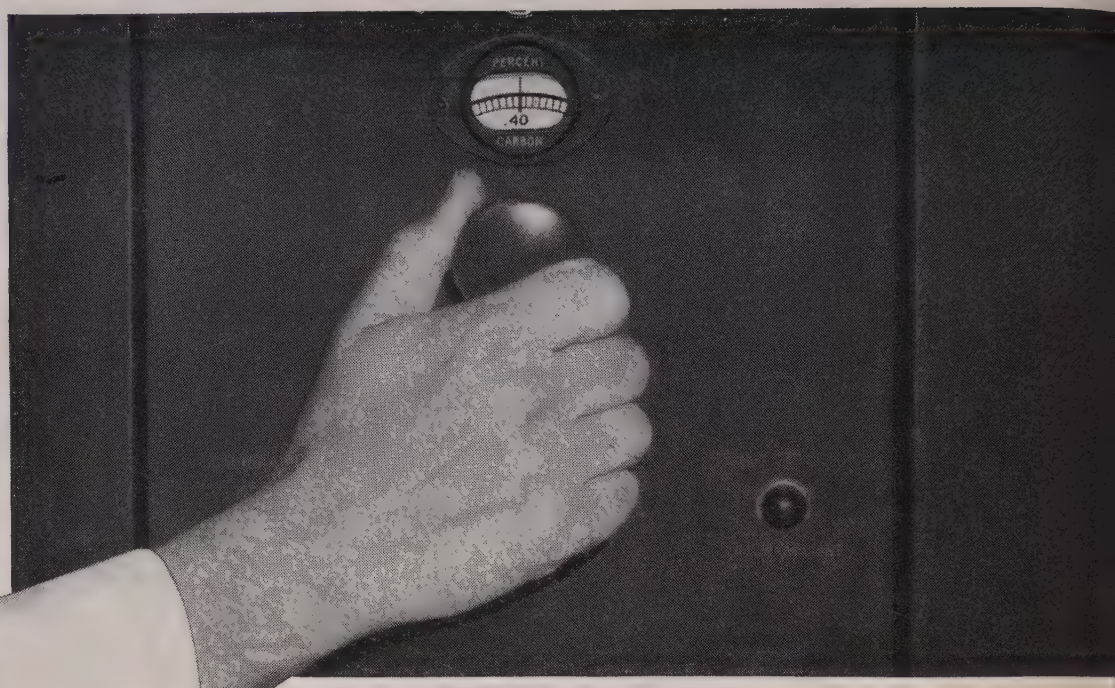
a name worth remembering when you want the best

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS



"Dial" Carbon

AS YOU DO TEMPERATURE

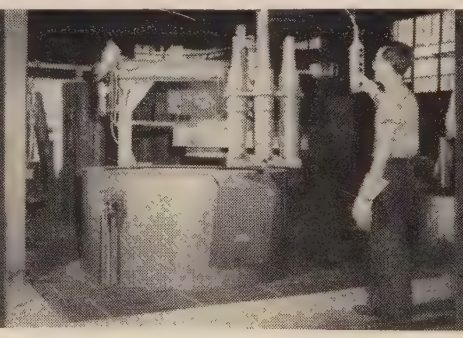
● Whether you're production heat treating small parts or bulky parts . . . gears or large shafts . . . Microcarb control provides a precise and easy method of regulating surface carbon.

With Microcarb, you can "dial" the carbon you want as easily as you'd set the temperature . . . the instrument then *directly* measures and controls the active carbon in the atmosphere surrounding the work. It is the *only* "closed loop" carbon control available.

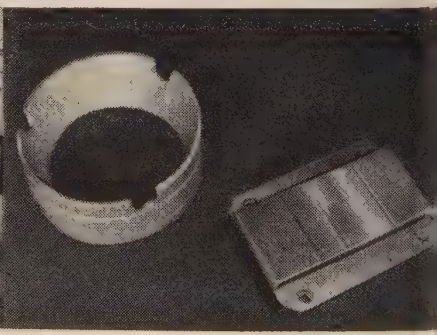
This new Microcarb control is integrated with the long established Homocarb Method of heat treating. To provide a heat that is unusually uniform throughout the load, the scientifically designed Homocarb furnace incorporates an advanced combination of fan housing and work support, with aerodynamically designed discharge jets . . . a solid bottom retort . . . a powerful fan.

For further information, write Leeds & Northrup Co., 4957 Stenton Ave., Phila., Pa.

CARBURIZING GEARS—These nickel-chromium-molybdenum steel aircraft gears manufactured by W. H. Nichols Co., of Waltham, Mass., are a "natural" for Microcarb control. The operator simply sets the carbon controller to the percent carbon desired—Microcarb does the rest.



HARDENING AIRCRAFT PROP SHAFTS—Parts of A.M.S. 6415 steel are easily hardened by Taft-Peirce Mfg. Co. of Woonsocket, R. I. in their Homocarb furnace with Microcarb control. Six 125-lb., 30 x 6 inch shafts are run at one time, and *all* specifications are being held without difficulty on *every* load.



HEAT TREATING A VARIETY OF COMPONENTS—With Microcarb, Jones & Lamson Co., Springfield, Vt. efficiently carburize machine tool parts such as the adjusting cone (left) or prevent carburizing and decarb of such parts as the Universal ball bearing slide (5% Cr.–1% C steel) at right.

LEEDS NORTHRUP

instruments *automatic controls • furnaces*

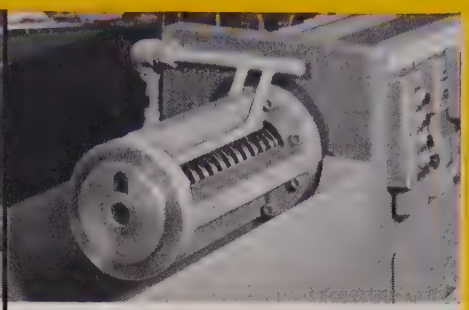
Jrl Ad T-623(32)

when designing

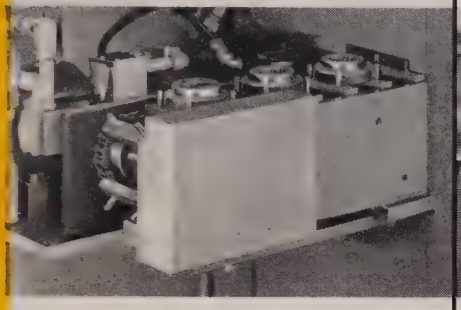
BROACHING FIXTURES

you need more than just a "hunch"!

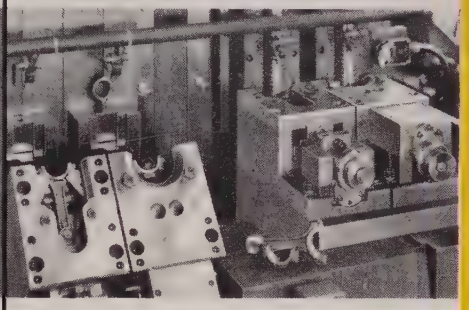
Close tolerance and exact spacing of holes in tank track shoes are made possible by this Lapointe V-8 Broaching Machine fixture.



Broach die-holding fixture, specially designed for easy coolant access and disposal of chips.

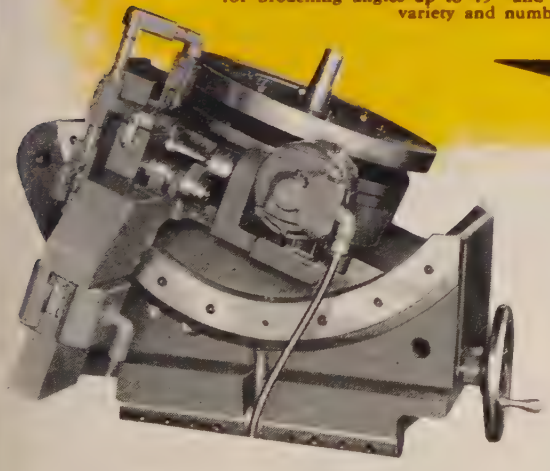


Operated unattended because of several built-in safety features, the Lapointe VU-3 Broaching Machine can broach helical splines in automotive gears through the use of this conveyor fixture.



The "Tip-Down" Fixture, exclusive with Lapointe, tips down to a position for easy loading, minimizes operator fatigue. Shown here on 15-ton Lapointe DRV Machine, for broaching connecting rods and caps.

Lapointe Universal Compound Angle Indexing Fixture, for broaching angles up to 45° and maximum variety and number of slots.



Varied fixture requirements of the different types of broaching machines — single ram and double ram, vertical and horizontal — call for engineering skill in fixture design that can only be gained through long experience. Lapointe engineers, with their 50 years of background, can refer to countless designs involving fixture principles that show remarkable ingenuity.

Whether, therefore, your need is for a broaching fixture that is simple or complex, manual or automatic, come to "fixture headquarters" . . . come to **LAPOINTE.**

Literature on broaching machine fixtures can be obtained by addressing Department 3.

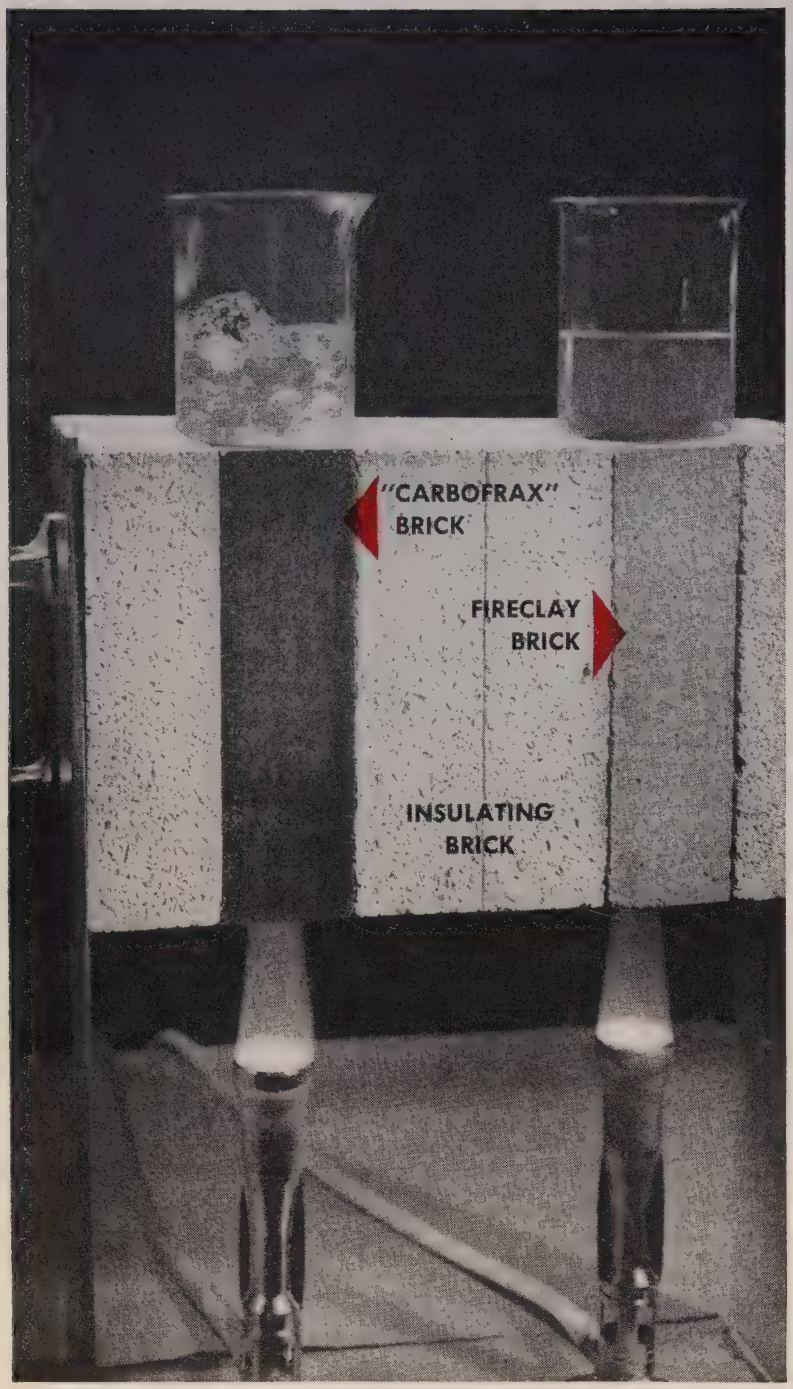
THE LAPOINTE MACHINE TOOL COMPANY

HUDSON, MASSACHUSETTS • U. S. A.

In England: Watford, Hertfordshire

HUDSON LAPOINTE MASS

THE WORLD'S OLDEST AND LARGEST MANUFACTURERS OF BROACHING MACHINES AND BROACHES



Two Meeker burners, two bricks — but see the difference! The beaker on the CARBOFRAX brick boils furiously (through *the length* of a 9" brick). The water on the fireclay brick is barely tepid.

Could you use a

Refractory that transmits heat

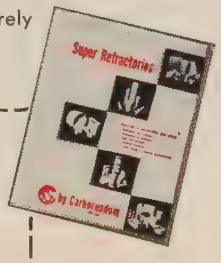
. . . as rapidly as chrome-nickel steels?

Here's a refractory that, in certain respects, is more akin to heat-resisting metals than to refractories. CABOFRAX silicon carbide refractory (same basic material as CARBORUNDUM brand abrasive) is, in many ways, one of the most indestructible of materials. At 2460 F., it has a crushing strength of over 10,000 psi. It is inherently resistant to even the most severe abrasion—often outlasting alloy parts, 5 or 10 to 1. And it can be used at temperatures up to and exceeding 3000 F....roughly 1000 degrees over the upper limits for metals!

But, most important, at elevated temperatures these refractories conduct heat approximately as fast as chrome-nickel steels. This is 11 to 12 times faster than fireclay refractories!

Thus CARBOFRAX refractories are ideal for radiant tubes, muffles, hearths, and other equipment using *indirect heating*. Since they absorb and release up to five times as many BTU's per second as fireclay, they are also perfect for *heat exchange* equipment, such as checkers or recuperator tubes. Conversely, these refractories play an important role where heat must be *dissipated* (e.g. arc shields, pot linings, etc.).

Do any of these applications suggest possibilities? If so, please write or phone us. And be sure to get our easy-to-read 20-page booklet. It describes the many unusual properties of our Super Refractories line. No obligation, of course.



Dept. G-53, Refractories Division
The Carborundum Company, Perth Amboy, N. J.

Send complimentary copy of Super Refractories booklet to:

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POSITION _____

COMPANY _____

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Super Refractories by

CARBORUNDUM
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"CARBORUNDUM" AND "CARBOFRAX" ARE REGISTERED TRADEMARKS OF THE CARBORUNDUM CO.—WORLD'S LARGEST MANUFACTURER OF SUPER REFRACTORIES

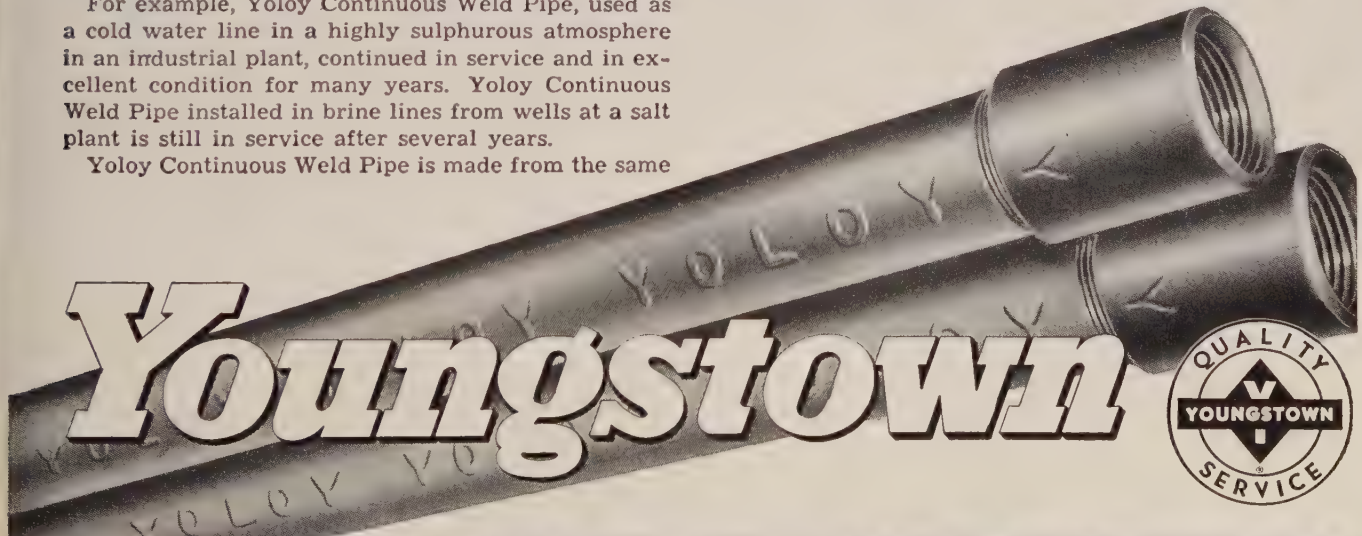
use YOLOY continuous weld pipe

Yoloy Continuous Weld Pipe offers distinct advantages for use in mines and industry where replacements due to corrosion are frequent. In addition, its use is recommended wherever piping is concealed—in commercial buildings, schools and residences.

In standard tests Yoloy steel has demonstrated that its resistance to atmospheric corrosion is four to six times greater than that of regular steels. In actual installations Yoloy Pipe has demonstrated that it has a high resistance to many other corrosive conditions.

For example, Yoloy Continuous Weld Pipe, used as a cold water line in a highly sulphurous atmosphere in an industrial plant, continued in service and in excellent condition for many years. Yoloy Continuous Weld Pipe installed in brine lines from wells at a salt plant is still in service after several years.

Yoloy Continuous Weld Pipe is made from the same nickel-copper steel composition that has proved so successful in service in the oil, mining, railroad, chemical, trucking and other industries where resistance to corrosion and abrasion is of prime importance. This pipe is easy to thread and fabricate with standard pipe tools. It can be electric or gas welded readily. It has high strength and high resistance to abrasion, shock and vibration fatigue. For further information, write or phone the Youngstown District Sales Office nearest you.



Youngstown

QUALITY YOUNGSTOWN SERVICE

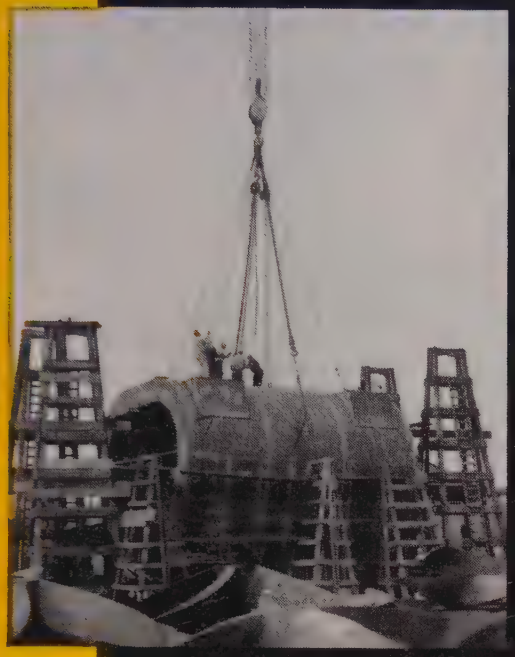
THE YOUNGSTOWN SHEET AND TUBE COMPANY General Offices Youngstown 1, Ohio

Manufacturers of Carbon, Alloy and Yoloy Steel Export Office-500 Fifth Avenue, New York

COLD FINISHED CARBON AND ALLOY BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES

1013

Here- a Cincinnati Press Brake saves 3 ways...



1. TIME
2. NUMBER OF OPERATIONS
3. MATERIAL

Built at The Maryland Drydock Company, these giant condensers for the Westinghouse Electric Corporation are some of the largest ever constructed.

Photographs courtesy of The Maryland Drydock Company, Baltimore, Maryland

Crimping plate up to 3″ thicknesses has cut roll-forming time in half at The Maryland Drydock Company.

The press brake crimps the ends of the plates with special dies, and has eliminated both the costly burning operation, and the loss of 15″ to 18″ of the ends of the plates.

Some of the large radius bends are done entirely on the Cincinnati Press Brake.

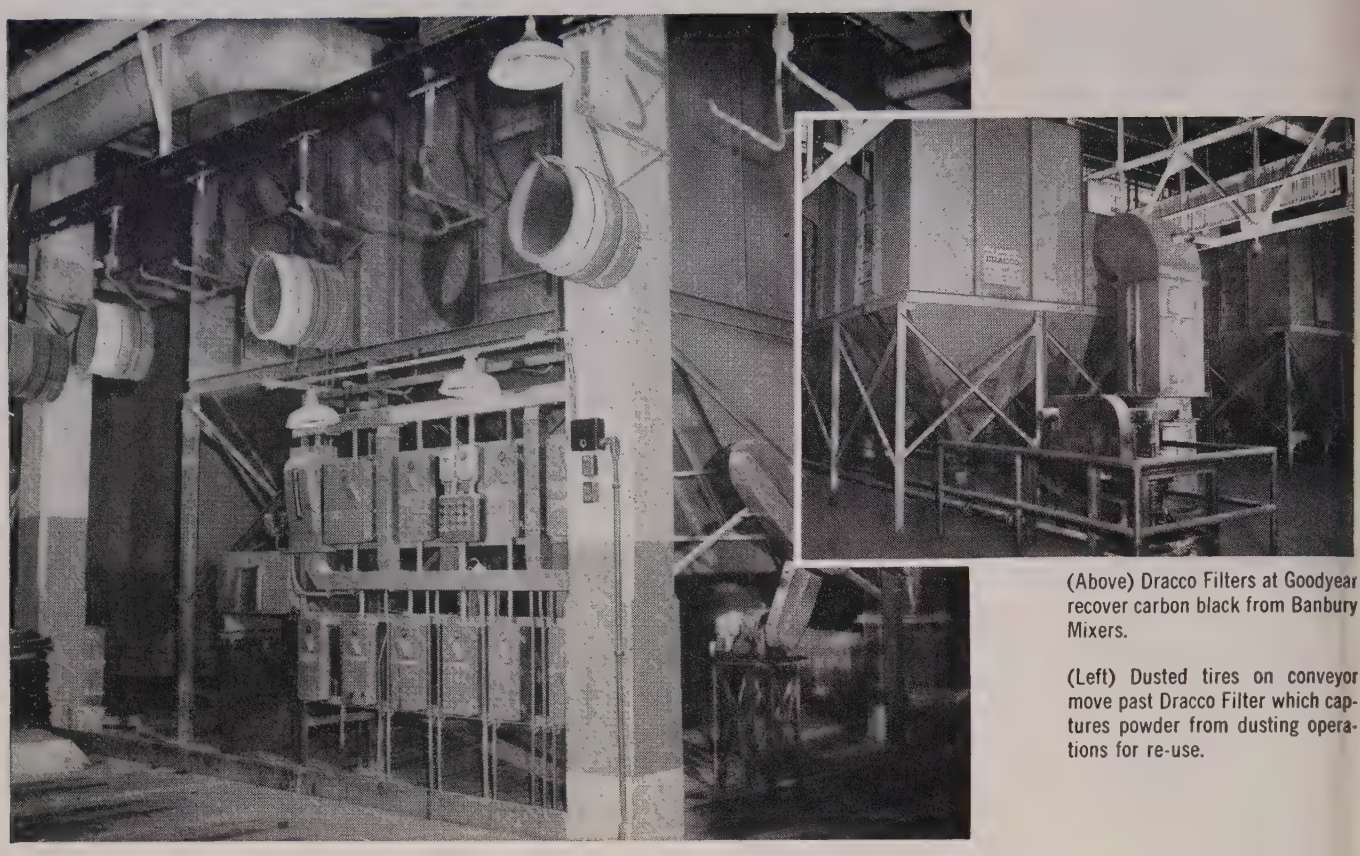
Write for the NEW 72-page Press Brake Catalog B-4.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES

CINCINNATI



(Above) Dracco Filters at Goodyear recover carbon black from Banbury Mixers.

(Left) Dusted tires on conveyor move past Dracco Filter which captures powder from dusting operations for re-use.

IT TOOK MORE THAN EQUIPMENT TO SOLVE GOODYEAR'S DUST PROBLEMS!

● Two special Dracco Dust Control systems were recently incorporated into existing processes at The Goodyear Tire and Rubber Co. in Akron, Ohio.

One system collects carbon black from Banbury Mixers; the other traps powder used for dusting uncured tires. In both systems Dracco's design provides for re-use of all collected materials by automatically returning them to process.

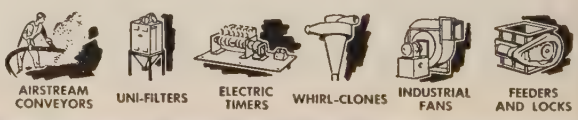
Even with superior Dracco Dust Control Equipment in these systems it took an extra something to assure highly efficient, integrated dust control. This was Dracco's *application engineering* which resulted in custom-designed installations exactly meeting Goodyear process requirements. This precise engineering was the key factor in turning Goodyear's dust problems into dust profits.

For greater industrial efficiency, control your plant dust. For greater dust control efficiency, remember Dracco—the Name, the System, the Engineering Skill.

DRACCO CORPORATION

4090 East 116th Street • Cleveland 5, Ohio

Dracco Bulletin 800 presents valuable information on "Industrial Dust Control and Recovery". Write today for your copy.



DRACCO

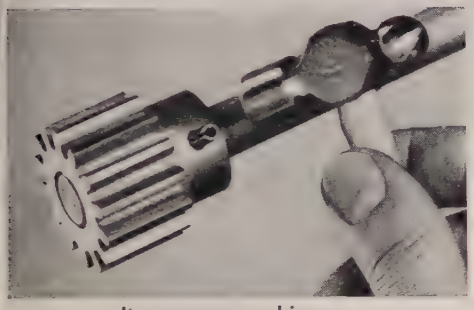
Performance Proved

Airstream **CONVEYORS • DUST CONTROL EQUIPMENT**

Where can you use this simple fastener?

No threading, peening or precision drilling with ROLLPIN

Rollpin is driven into holes drilled to normal production-line tolerances.



It compresses as driven.

Rollpin fits flush . . . is vibration-proof.

Rollpin is the slotted tubular steel pin with chamfered ends that is cutting production and maintenance costs in every class of industry.

This modern fastener drives easily into standard holes, compressing as driven. Its spring action locks it in place—regardless of impact loading, stress reversals or severe vibration. Rollpin is readily removable and can be re-used in the same hole.

* * *

If you use locating dowels, hinge pins, rivets, set screws—or straight, knurled, tapered or cotter type pins—Rollpin can cut your costs. Mail our coupon for design information.

Elastic Stop Nut Corporation of America
Dept. R16-560, Vauxhall Road, Union, N. J.
Please send me the following free fastening information:

- ☐ Rollpin bulletin
- ☐ Elastic Stop Nut bulletin
- ☐ Here is a drawing of our product. What fastener would you suggest?

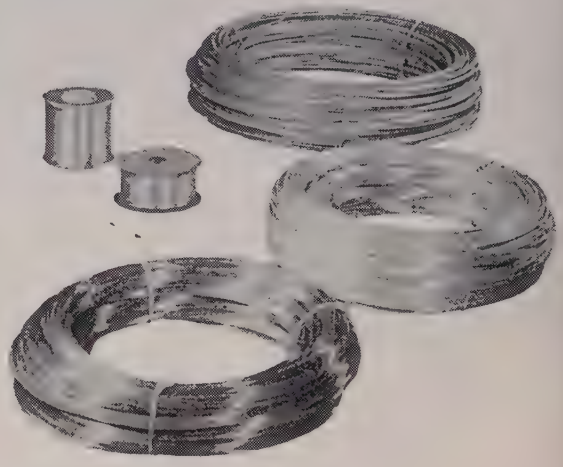
Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

KAISER ALUMINUM PRODUCTS

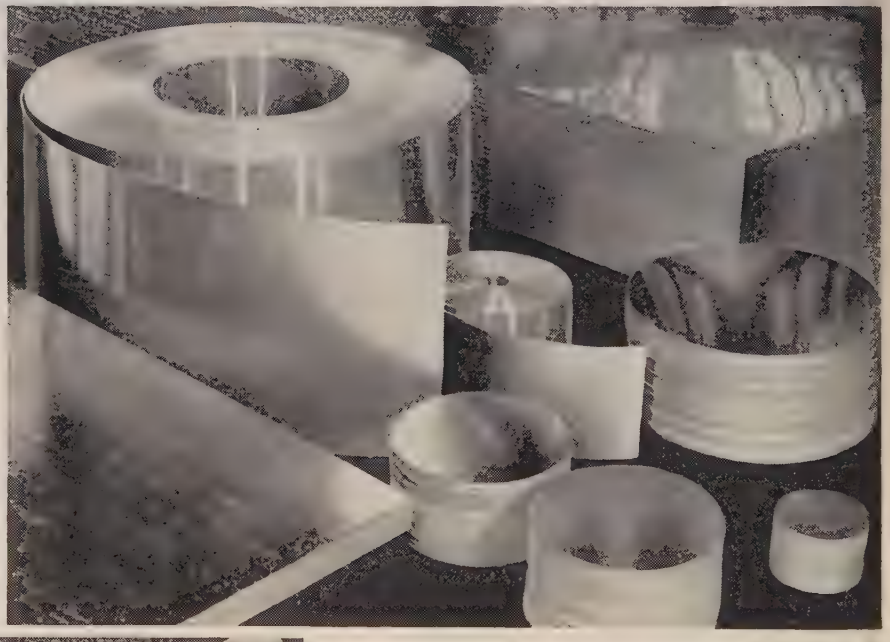


Wire

Supplied as round drawn wire, hexagonal wire, rivet wire, welding wire, screen wire, EC wire, redraw wire.

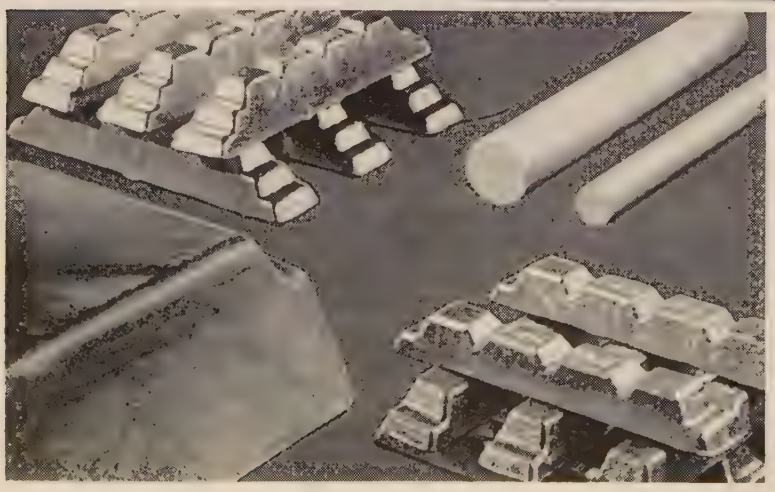
Rod and Bar

Available in a wide range of alloys in rolled and cold finished rod and bar, round and hexagonal standard screw machine stock, hexagonal bar, redraw rod, rivet rod and round forging stock.



Sheet and Plate

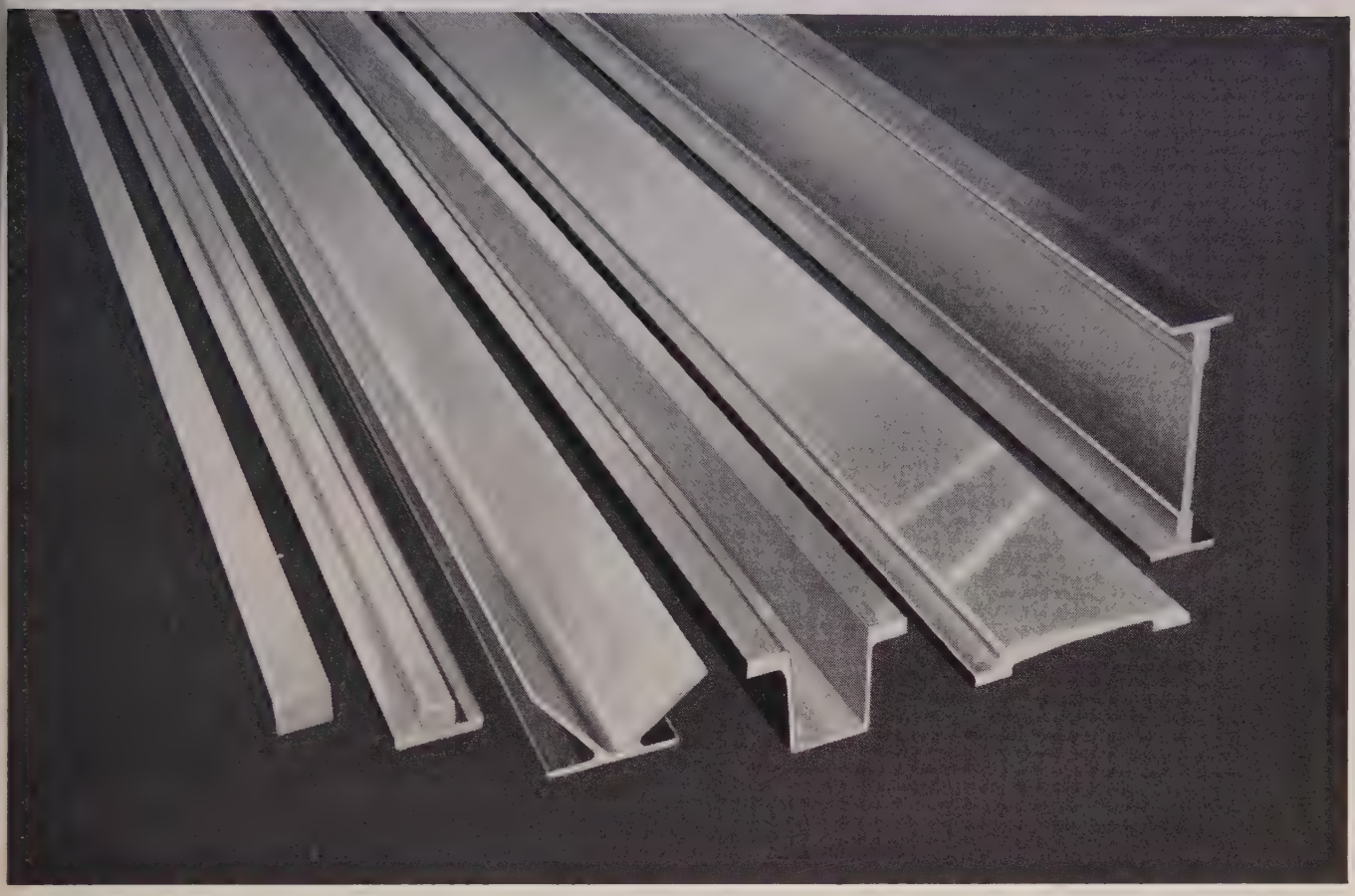
Supplied as flat sheet, plate, coil sheet, circles in a complete range of alloys, sizes and tempers. Specialty sheets also produced to fill volume requirements.



Pig, Ingot and Billets

Kaiser Aluminum produces Pig, Ingot and Extrusion Billets in a range of alloys and sizes to meet your specific requirements.

for you...the nation's fabricators



Extruded Shapes to meet your specifications

Available in solid, rod, bar, semi-hollow and hollow shapes in all standard alloys. Also available in tubing. In addition, Kaiser Aluminum provides the services of its engineers to work closely with you to select proper alloys or to help improve production methods.

To SUPPLY you and thousands of other fabricators with aluminum in the forms in which it can be used most economically, Kaiser Aluminum produces a broad line of basic and semi-finished mill products.

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Other Kaiser Aluminum products include: Industrial Foil, and electrical conductor. Kaiser Aluminum also supplies household, freezer and broiler foil for home uses, Shade Screening for the building industry and corrugated Roofing Sheet for farm and industrial buildings.

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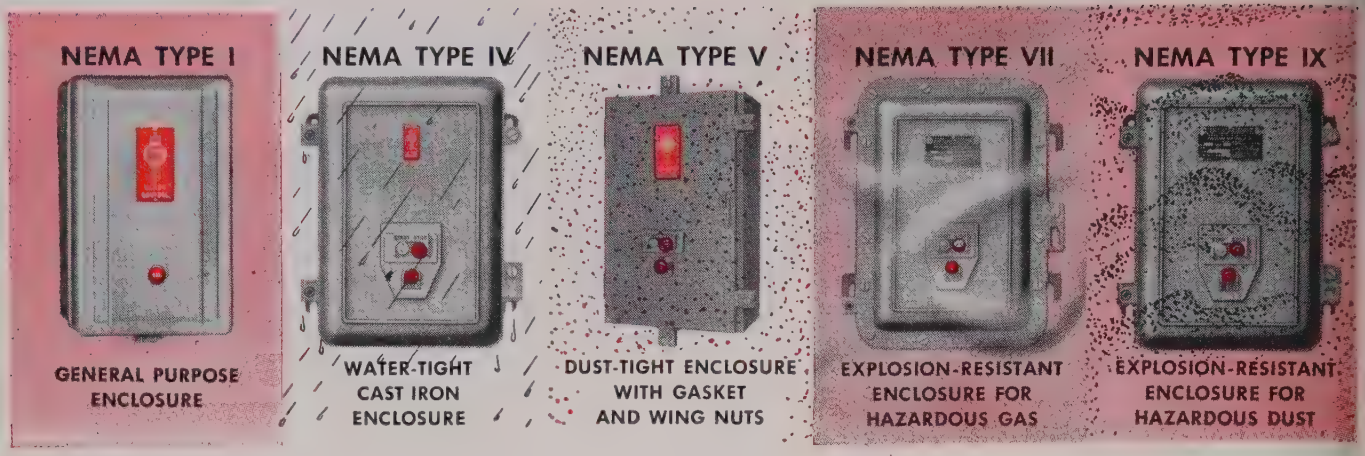
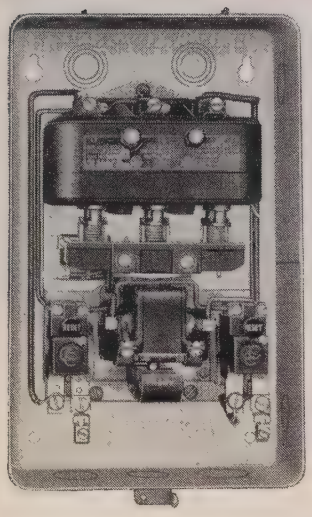


for every operating condition
use CLARK TYPE "CY" STARTERS

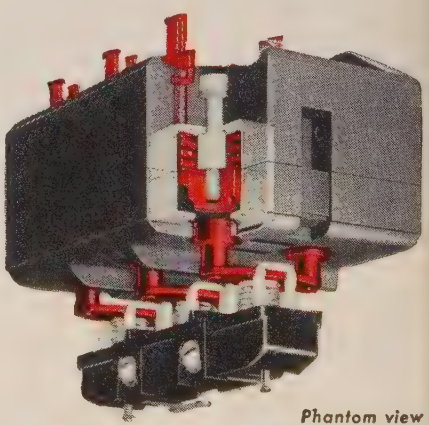


In every industry, including those where hazardous atmospheres prevail, CLARK TYPE "CY" STARTERS are giving utmost satisfactory service.

The incomparable new multi-turn magnetic blowouts combined with twin-break contacts, and the rest of the operating mechanism, are enclosed in types of cabinets to protect against adverse conditions or dangerous atmospheres.

Type "CY" starters, Sizes 2 and 3, employ an entirely new principle of arc interruption. The arc is extinguished by the effect of the blowout coil, concentric with the contact. The magnetic field quenches the arc either by lengthening or confining it. In its forced rotation it moves continually from a hot to a cold spot—minimizing burning or pitting of contacts. The ingenious design of the arc chamber prevents carbonization and the accumulation of hot gases between wiring terminals—minimizing phase-to-phase failures. Sizes 0 and 1 use the same general mill type construction as the larger sizes.

- **No filing, dressing or cleaning of contacts!**
- **No tools necessary to inspect contacts!**
- **Easy to change moving contacts!**
- **Stationary contacts changed quickly!**
- **Remove only two screws and one pin to change coils!**
- **Remove only four screws to take out stationary magnet frame!**
- **Power circuit contacts available with springs in complete packaged service kits for ease in stocking!**



Phantom view showing Arc-shield

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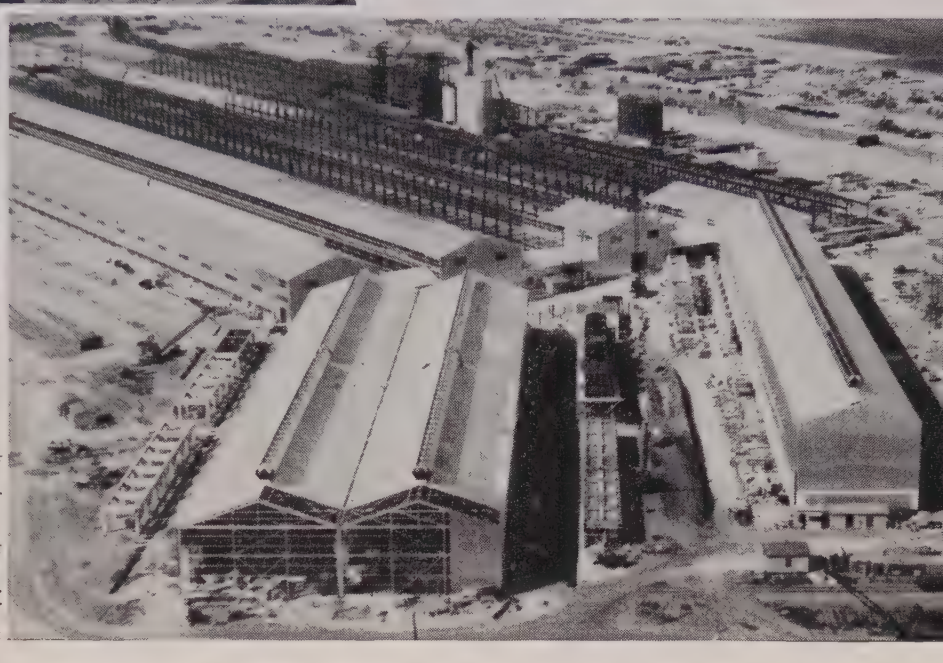
REYNOLDS METALS COMPANY, San Patricio Plant, Corpus Christi, Texas, for increased production of aluminum.



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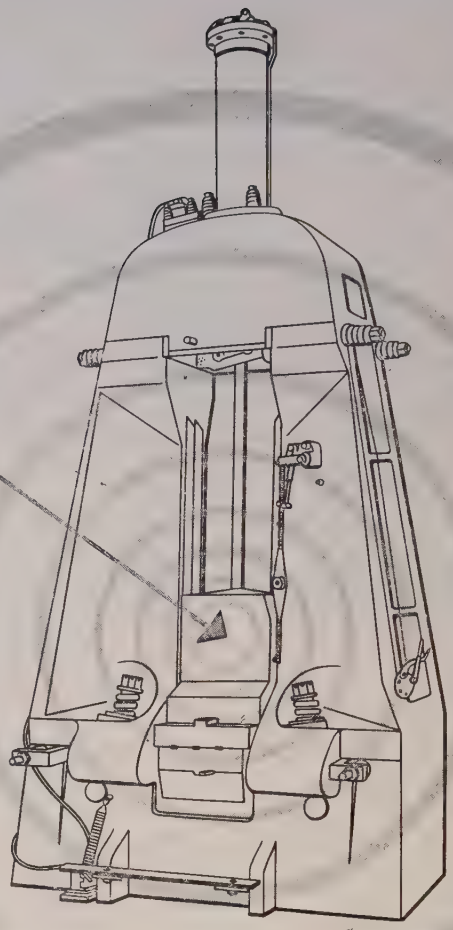
AMERICAN BRIDGE

USS TRADE MARK

UNITED STATES STEEL

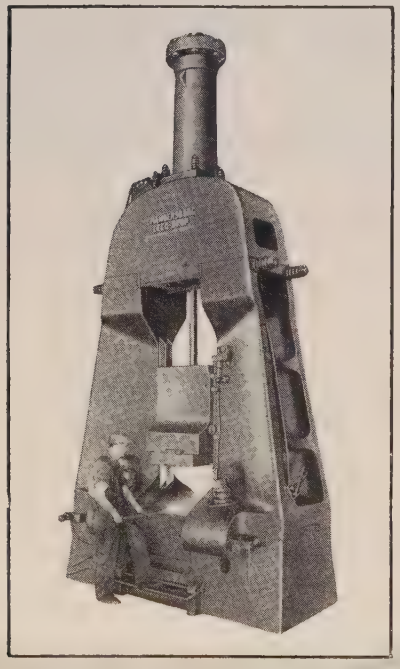
CENTER OF GRAVITY AT POINT OF IMPACT



• • • The center of gravity of the CECO-DROP concentrates the forces toward the base and gives a more effective blow.

• • • The center of gravity of the whole hammer approximates the center of gravity of the ram at the point of impact minimizing the fight between the ram and the other parts of the hammer.

• • • The resultant maintenance of die alignment assures fewer rejects and higher production in comparison with other types of forging hammer. This is an outstanding difference between CECO-DROPS and other hammers.



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are the result of more than a half century of experience in the design and manufacture of hammers. They cost less to operate. There are no board changes, no friction adjustments, and lubrication is automatic. Treadling the Ceco-Drop is easy and not fatiguing, and die alignment is held. The unique stroke adjustment and short stroke control afford a wide range of operation. Ask for our Bulletin 11-L-O.

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EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing... that this spring steel is absolutely in a class by itself for dimensional and mechanical uniformity... for speeding production and cutting down rejects.

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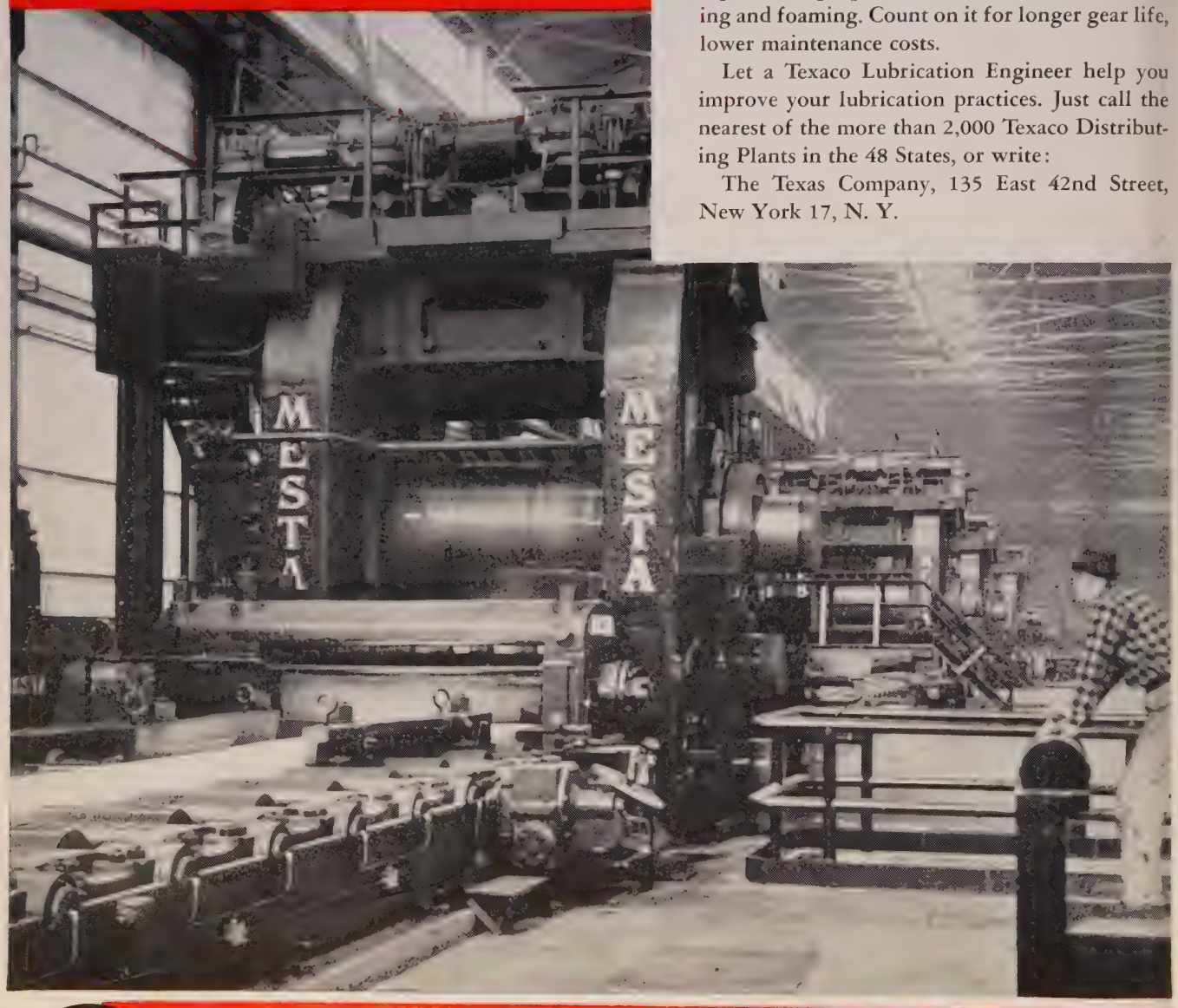
Texaco Regal Oil is a turbine-quality lubricant that keeps lines and bearings clean. It resists oxidation, emulsification and sludging . . . stands up under the heavy loads and high temperatures imposed. There is a complete line of *Texaco Regal Oils* to meet your exact requirements.

On the drive side, protect your enclosed reduction gears with *Texaco Meropa Lubricant*. It has superior EP properties, resists oxidation, thickening and foaming. Count on it for longer gear life, lower maintenance costs.

Let a Texaco Lubrication Engineer help you improve your lubrication practices. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

TUNE IN: Tuesday nights on television—the TEXACO STAR THEATER starring MILTON BERLE. See newspaper for time and station.

The Metalworking Outlook

May 18, 1953

Steel Talks: Crucial in 1954

Many steel industry executives are more concerned about the outcome of 1954 contract negotiations than they are about those that are going on now. Although the current parleys could possibly hit a snag and result in a strike, most labor observers believe that they are primarily interim talks that can be settled peaceably with a moderate wage hike. Next year's battle looks like it will be more serious because the whole contract must be rewritten, and tough questions of the guaranteed annual wage and pensions will be thoroughly aired.

How T-H Will Change

Any changes that finally evolve in the Taft-Hartley Act will be: A streamlining of the National Labor Relations Board to speed action on cases; a rewriting of some sections so that they don't conflict with state laws; and revision of the national emergency provisions, to give the President greater flexibility in his actions. There's virtually no chance for a ban on industry-wide bargaining.

Another Agency Goes

Still another controls agency, Defense Electric Power Administration, will die June 30. Electric power generating capacity is being increased from 67.5 million kw on Jan. 1, 1951, and 81.5 million kw on Jan. 1, 1953, to 113.5 million kw on Jan. 1, 1956. Since DEPA was created in December, 1950, it has approved 605 applications for fast amortization tax certificates representing an estimated increase of 21.6 million kw in the nation's electric power generating capacity at a total cost of $3.8 billion.

Dow Boosts Magnesium

Dow Chemical Co. is getting set to increase its civilian magnesium sales, which now are only 40 per cent of its total volume of the metal. The company, which supplies magnesium ingots to fabricators, expects that die castings for trucks and automobiles may be a leading source of civilian sales. Other civilian uses include trailer flooring, ladders for household and maintenance use, materials handling equipment and furniture. Dow expects its Madison, Ill., plant for magnesium production to be in full operation by Jan. 1, 1954.

Tax Cut Prospects Darker

The administration's recommendations on personal income and excess profits taxes will be submitted this week. The White House proposals will be pretty gloomy and will make Rep. Daniel Reed (Rep., N. Y.), the champion of tax reduction, decidedly unhappy. Chances now are for much smaller tax cuts than those proposed by Mr. Reed. Although the White House estimates a deficit for fiscal 1954 of $5.9 billion, Sen. Robert Taft thinks it may go as high as $11 billion.

Federal Sales Tax?

New support is coming for a federal sales tax, although its actual imposition is still a long way off. The Commerce department's Busi-

Production-Engineering News—p. 89 *The Market Outlook—p. 145*

ness Advisory Council recommends the levy. The top industrialists on the council believe that federal income is too dependent upon corporate and personal income taxes which could drop with a thud in case of depression.

Hope for Business Census

There's still hope for a 1953 census of business and manufacturers. The House passed a Commerce department budget that contained no provision for the census, to the dismay of marketing, distribution and economic specialists in industry. The Senate Appropriations Committee starts consideration of the House measure and may hold hearings on the subject. If so, get in your say.

More U. S. Highway Aid

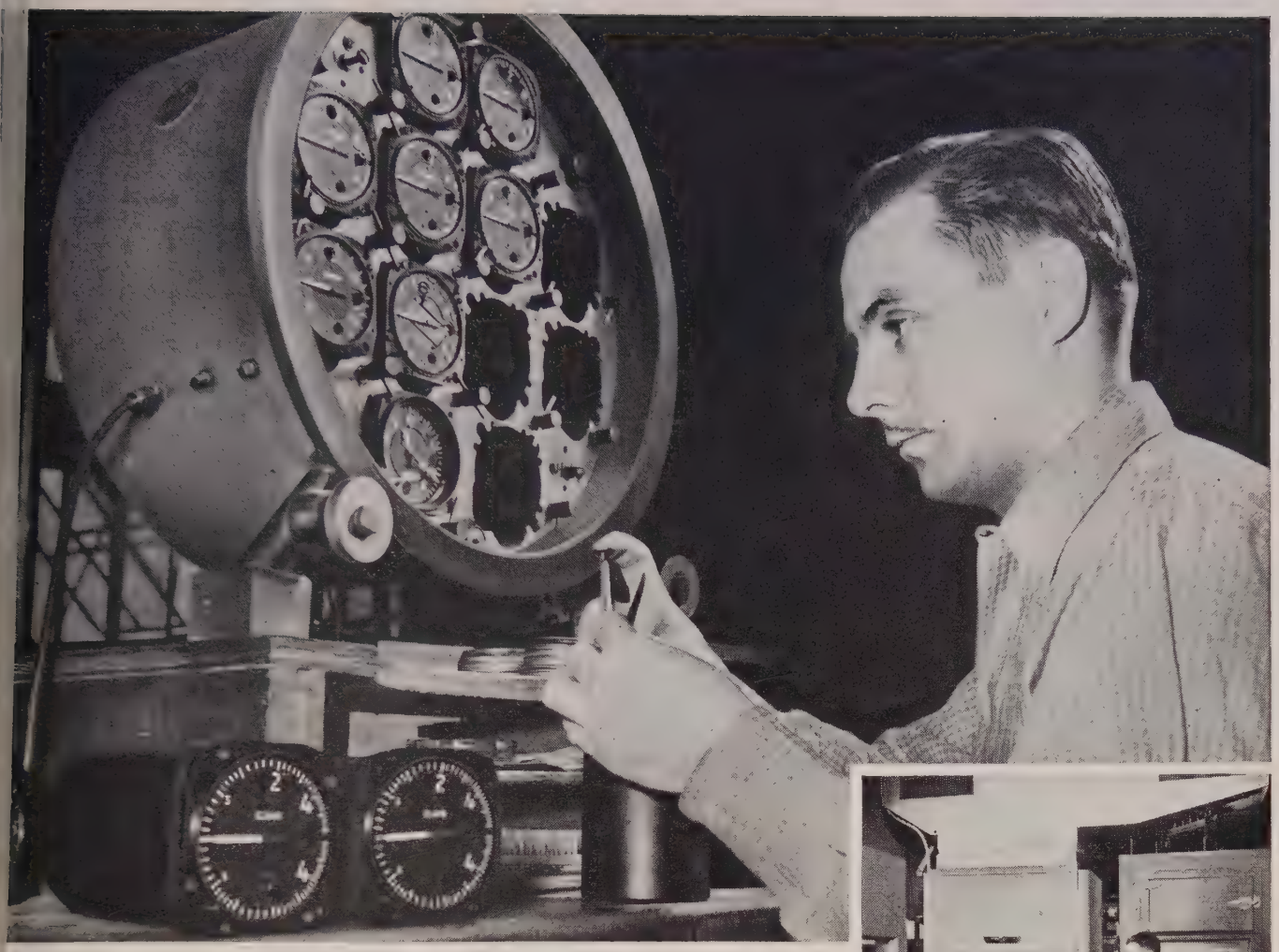
Federal aid for highways is on the increase but it promises to be even higher after fiscal 1954. The House Public Works subcommittee on roads will continue its hearings on the subject for another two or three months to get an early start on next year's legislation for federal aid to the states in fiscal 1955 and 1956. State governors point out that the U. S. takes in $2 billion annually from automotive and gasoline taxes but is contributing only $575 million a year to the states for highway construction.

Straws in the Wind

A 10 per cent reduction in taxes would more than counteract the effect of any proposed reduction in defense expenditures, says the National Association of Credit Men . . . Some 14 million tons of ingot steel will go for defense and atomics in 1953, compared with 12 million tons in 1952 and 33 million tons in the peak World War II year, 1943 . . . The Interstate Commerce Commission will hold oral arguments on May 21 regarding its formula for dividing freight revenues on traffic moving between the East and South . . . National Association of Scale Manufacturers says industry loses an estimated $2 billion a year by giving overweight.

What Industry Is Doing

For hints on how to cut down the turnover in top management, estimated at 12 per cent a year for industry generally by some experts, see p. 47 . . . Used drum processors expect business to keep on rolling well in 1953 (p. 48) . . . There's little tightening in fastener sales (p. 49) . . . Corporate 1952 sales rose $5 billion to $250 billion, but 1952 net profits after taxes dropped $1 billion to $10.7 billion (p. 50) . . . Steelworkers' average hourly earnings, not counting fringe benefits, have climbed 48.5 cents since 1939 (p. 51) . . . Two St. Louis area steel companies are adding to mid-America's steel capacity (p. 52) . . . Better take a new look at your costs (p. 58).



Putting Air To Work For Kollsman: When accuracy measures ± .0002, dirt specks and moisture are poison.

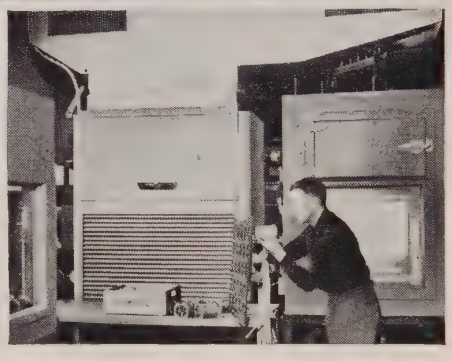
CONDITIONED AIR

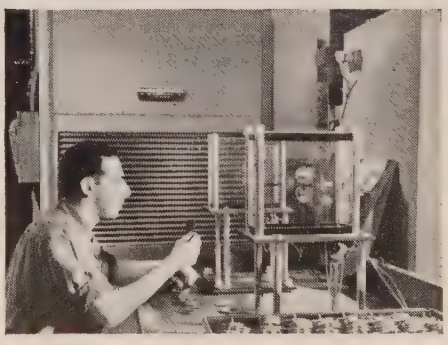
KEEPS INSTRUMENTS ACCURATE 15 MILES UP

Airborne dirt and moisture are an expensive problem in assembly and testing of delicate aircraft instruments. But Kollsman Instrument Corporation found the economical solution. Fifteen Westinghouse Unitaire® Conditioners now process the air for an entire assembly floor.

By "zoning" this space, each UNITAIRE cools and dehumidifies its assigned area. This gives uniform air conditioning even though heat and moisture-producing operations on the floor vary. And Unitaire Conditioners are easily moved as production layouts change.

You can get the UNITAIRE now from your Westinghouse Air Conditioning Distributor's stock. Call him today. He's listed in the Yellow Pages of your telephone directory. Westinghouse Electric Corporation, Air Conditioning Division, Hyde Park 36, Massachusetts.





Where heat and humidity hamper skilled hands, a UNITAIRE gives constant temperature-humidity control. That's why Quinn Engineering Co., New York, has added ten more units to another Kollsman plant this year. Completely built by Westinghouse with its own proved parts, the UNITAIRE gives trouble-free service and economical operation.

WESTINGHOUSE AIR CONDITIONING

YOU CAN BE SURE...IF IT'S Westinghouse

J-80310

Special Zinc-Coated Steel Takes Deep Draws

This series of draws is typical of what you can do with Armco ZINCGRIP—a special zinc-coated steel. There's not a flake, not a break in the zinc coating. It stretches and flows with the base metal to provide continuous rust protection after drawing. This is because the specially applied coating takes as severe a draw as the steel base.

It stays rust-free longer

The special hot-dip coating on Armco ZINCGRIP gives protection against yellow rusting in atmospheric service longer than equal weight coatings on regular galvanized sheets. Many actual field tests have proved this.

A paint-holding sheet

The same deep-drawing zinc-coated sheet supplied with a mill-applied Bonderized finish is known as Armco ZINCGRIP PAINTGRIP. It has all the deep-drawing and forming qualities of ZINCGRIP—plus a finish that takes paint immediately and preserves it longer.

let ZINCGRIP save you money

If you have hesitated to use pre-coated steel because your product requires severe forming or drawing, find out more about Armco ZINCGRIP and ZINCGRIP PAINTGRIP. Both products are supplied in cut lengths or coils, in 11 through 28 gage and up to 54 inches wide depending on gage. Supplied in regular commercial weight coating or up to 2.00 oz. per square foot.

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Write for our booklet, "Armco ZINCGRIP and ZINCGRIP PAINTGRIP" for complete information.

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Enhancing the Investment

An important event on this week's calendar for thousands of metalworking executives is the Fifth National Materials Handling Exposition, to be held in Convention Hall, Philadelphia. In the brief period of a few years, it has become one of the major shows of interest to metalworking companies.

Why this rapid growth? Why is it that this materials handling show almost overnight has won an acceptance equal to or exceeding that which some other highly regarded shows have received only after decades of gradual growth?

The answer is not simple, but it lies in the fact that since the end of World War II increase in the efficiency of handling materials has been one of the easiest ways of offsetting the mounting costs of manufacture attributable to inflation. Also, inasmuch as materials handling is an operation of great importance in almost every line of industrial activity, interest in economical handling methods is widespread.

For instance, regard the sheet of paper you are reading. Its weight is negligible but it has to be handled a dozen times before it reaches your desk. Every improvement made in type setting, printing, folding, binding, trimming and packaging equipment introduces new problems in materials handling. Thus the printer is just as conscious of lift trucks, conveyors, etc., as any metalworking plant.

In like manner, whenever a manufacturer has the good fortune to discover a method of increasing the production of a furnace, a fabricating technique or a finishing process, he immediately imposes greater burdens upon his materials handling facilities. In fact, it is difficult to conceive of any great improvement in production capacity or efficiency that does not involve drastic changes in materials handling. Thus we can have a condition where a manufacturer is smart if he orders a $100,000 machine to save $20,000 a year in production costs, but also can be dumb if he turns down a $30,000 investment in materials handling equipment that would make the $100,000 machine investment doubly attractive.

The show in Philadelphia this week will illustrate many ways in which efficient materials handling equipment can enhance the value of an investment in production machinery.

E. L. Shaner

EDITOR-IN-CHIEF

FIRST ORDER OF DAY: While on the subject of materials handling, we should not overlook two examples of highly specialized handling techniques that are in the news. Last Tuesday, officials in western Texas dedicated a 26 inch, 466-mile-long crude oil pipeline having a capacity of 300,000 barrels daily. It is the largest single carrier of petroleum in the country.

Last week also witnessed the meeting and ex-

position on the American Mining Congress in Cleveland. Here the accent was on mining machinery and heavy earthmoving equipment. It is noteworthy that every time manufacturers of underground mining machines such as Joy, Jeffrey or Goodman, bring out a new model capable of cutting more tons of coal per hour at the face of the mine, an immediate result is the necessity for devising more efficient means of sweeping the dislodged coal onto conveyers and of transporting it by belt or other haulage systems out of the mine to truck, railroad car or river barge.

Whether the problem is moving stuff in units of a fraction of an ounce or of dozens of tons, efficient materials handling is the first order of the day.

* * *

A CHANGE FOR BETTER: A noticeable change has taken place in the attitude of the federal government toward labor disputes. During the Roosevelt and Truman administrations, even the slightest sign of friction between employer and the union representing his employees was a signal for federal mediators to intervene en masse. Big shots like Philip Murray and Bill Green could enter the White House day or night to present their cases. Often the government administration found itself so thoroughly involved in the dispute that eventually it became virtually the business agent of the union.

Since January 20 the scene has changed. The successors to Messrs. Murray and Green do not fly in and out of the White House at will. Federal mediators do not jump excitedly every time a strike is threatened. The administration is not offering its support to either side. Its return to the sensible role of an impartial umpire is welcome and in due time will promote better labor relations.

* * *

WIVES WERE CONSULTED: When it was announced that Henry Ford's papers and personal correspondence would be preserved in the old Ford residence in Dearborn, much was made of the fact that the data indicated that Mrs. Ford had a voice in many important decisions which Mr. Ford made on behalf of his company. Specifically it was stated that it was she who insisted that the Ford Motor Co. deal with the CIO as the union representing Ford employees.

That Mrs. Ford was consulted on such matters is not unusual. Ford Motor was one of the few remaining family-owned large industries. Previously, when family-owned businesses were the rule rather than the exception, the wife often was consulted on matters of policy. The pertinent point is that family ownership is becoming a rarity.

* * *

SEE FIRST IRON WORKS: One of the most interesting restoration projects under way in the United States today is the work of the First Iron Works Association which is reproducing the first successful iron works in America at Saugus, Mass. According to George S. Rose, secretary of the American Iron & Steel Institute, which is sponsoring the restoration, the blast furnace, water wheel, bellows and casting house have been completed. The forge building now under construction is expected to be completed this fall. It will include a finery and chafery and 505-pound hammer, the original of which was dug up on the site some time ago.

It is expected that thousands of visitors will be attracted to the exhibit at the First Iron Works restoration at Saugus this summer. It should be a mecca for persons identified with metalworking.

* * *

A WORTH-MORE DOLLAR: It is amazing how some people cling tenaciously to the idea that the artificiality of an economy supported by inflation is good for the country. A group of congressmen is urging the Federal Reserve Board to buy up government bonds at par. A few persons are squawking about the higher cost of borrowing money. There are other signs that the administration's hard money policy is not popular in some circles.

Perhaps it is difficult for some people to change habits that have become entrenched since 1939. However, when signs that the value of the dollar actually is increasing rather than declining become more apparent, the skeptics will change their tune. In time they will respect a dollar that is more worth earning, borrowing, saving, lending or investing.

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30" Strip Mill In

Quality Maximum Production

The Alan Wood 30" continuous strip mill is maintaining production of plates, sheets, and strip at the maximum speed permitted by top quality standards.

We are now working to improve this performance—to serve you even better by expediting production and shortening delivery cycles.

Helping us gain this goal of finest quality and maximum production is Alan Wood's undivided responsibility from mine to mill to market. It applies to *all* of the many Alan Wood products—of which sheet, strip and plates are only a few.

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FASTEST MACHINING STEELS!

You get them all . . . at Ryerson

Interested in cutting the cost of machined parts? Your nearby Ryerson plant offers quick delivery of the fastest cutting steels on the market—steels that will boost man-hour production; save you money.

Carbon steels, alloys, stainless—whichever you need, Ryerson is your best source. Take Ledloy for example. This open hearth steel machines at surface speeds of 300 feet per minute or better, making it the fastest cutting steel available today. And Ryerson was the first to offer Ledloy for shipment from stock.

Similar in chemistry to C1213, Ledloy contains a very small amount of lead which acts as a lubricant between steel and cutting tool. As a result Ledloy users get greater production, longer tool life and a better finish on machined parts. In addition, Ledloy can be case hardened, bent or swedged.

The wide selection of other free-machining steels in Ryerson stock—ready for quick shipment, is indicated by the brief list at right. And remember, our steel specialists are always glad to work with you on any machining problem.

So call Ryerson for free-cutting steels and every other steel requirement.

Fast cutting steels in stock

LEDLOY—You can't buy a faster machining steel. See why at left.

RYCASE—Low carbon, high manganese, open hearth steel with excellent case hardening characteristics. Yet machinability rating is within 10% of Bessemer screw stock.

C1117—Open hearth high manganese steel widely used for combination of good machinability and good carburizing properties.

B1113—If you want Bessemer screw stock, this is one of the fastest available. Machines at 225 SFM. High sulphur content.

C1213—The open hearth equivalent of B1113. Machinability slightly better. Cold working properties are much better.

B1112—The standard Bessemer screw stock on which machinability ratings of other steels are based.

C1141—Often used instead of C1042 because of high strength, better machinability and greater resistance to wear. Responds well to heat treatment, flame or induction hardening.

RYTENSE AA—Improved medium carbon, high manganese steel. Machines at 125 SFM, leaving smooth finish. Good as-drawn mechanical properties and may be heat treated or hardened.

RYCUT ALLOY STEEL—A medium carbon alloy that machines 25 to 50% faster than standard steels of same type.

FREE-MACHINING STAINLESS—Type 416, a 12% chrome analysis with superior free-machining properties. Also Type 303 for better corrosion resistance with excellent machinability.

E-Z CUT PLATES—Special high manganese steel with controlled sulphur addition. Cuts cleanly at speeds up to 35% faster than ordinary steel.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

WITH EXECUTIVES QUITTING . . .

- For bigger jobs
- For a better future
- For more money
- Over disagreements on policy

At Today's Faster Rate . . .

SEPARATIONS PER YEAR PER 100 EXECUTIVES*

Industry	Prewar Rate	Postwar Rate	Per Cent Change
ALL DURABLE GOODS . .	6.2	9.4	Up 51.6
Fabricated Metals	4.9	7.5	Up 53.1
Electrical Machy. & Equip.	6.8	14.1	Up 107.3
Machinery (except elec.) .	4.8	7.7	Up 60.4
Transportation Equipment	5.8	10.4	Up 79.3
Primary Metals	7.6	6.9	Down 9.2

*A five year average. Source: Booz, Allen & Hamilton

HERE'S HOW TO HOLD THEM . . .

- Set company goals
- Define policy clearly
- Modernize compensation plans
- Boost team spirit

Hold Onto Your Key Men

Chances are greater now than before World War II that you'll lose a member of your top management team. Here are four steps you can take to minimize those chances

EXECUTIVES are on the move. The threat of losing a key man—or a man with high executive potential—hovers in the air.

But you *can* do something to hold onto your top executive group besides hope and pray.

Sign of the Times—Why are management men looking for new jobs? Basically, because the times are right. The same survey by Booz, Allen, & Hamilton, management consultants, which documented the higher quitting rates since World War II (in the chart above), also showed hiring rates are up greatly. In an expanding economy, there are more jobs available and the human thing to do is look them over.

Unfortunately the future holds the same ominous threat. If the present trend continues, individual supervisors and executives will have fewer workers under their control. More executives will be needed. Even after the vacuum of management experience created by World War II is filled, the effects of lower marriage and birth rates during the depression will be felt in thinner ranks of prospective executives during the next five to ten years.

What's To Be Done?—There are definite steps you can take to minimize the chances of losing good executive talent in your operation. First, learn the major reasons for industry's loss of management personnel.

"Generally speaking, it's retirement," says W. R. Elliott, vice president in charge of industrial relations, Jones & Laughlin Steel Corp., Pittsburgh. "Death, and to a much lesser extent retirement," reports T. R. Mullen, president, Lehigh Structural Steel Co., Allentown, Pa. The BA&H survey bears out these statements, finding that, postwar, deaths and retirements account for about 56 per cent of executive separations—the same rate as in prewar days; layoffs and discharges account for an additional 6.6 per cent.

Uncontrollable—Those losses, while largely uncontrollable, can be foreseen and prepared for. Of greater interest are voluntary resignations, accounting for 37.4 per cent of postwar executive separations. More than half of 422 executives interviewed by BA&H gave one of the four reasons in the table above for their voluntary quits. To a certain extent, these are uncontrollable losses, too. If you haven't an opening higher up, you can't promote a man no matter how good he is. That doesn't mean you're helpless to enhance your chances of holding him.

Fundamentally, the proposition is this: Business used to be able to go out and buy labor like a raw material. Social and economic forces changed that, have increased the employer's responsibility. He must now appeal to labor through more than labor's pocketbook. Here are four steps you can take to do just that.

Set Company Goals—Executives want to work for a company that's going somewhere. If the board of directors is hazy on the proper course of action, you can be sure the mist thickens in the lower echelons of management.

Define Policy Clearly—Two things can be thus accomplished: Misunderstandings are avoided as to who does what, as to why who got promoted; the individual can fit himself into the pattern.

Modernize Compensation—Money still talks loudly but key executives are more interested in take-home compensation than in a taxable yearly dollar figure. There are many ways to increase take-home benefits such as stock bonus plans, profit sharing plans, retirement plans. A study, *Pay Contracts with Key Men* by V. H. Rothschild II and W. J. Casey, lists the arrangements used by 85 different U. S. companies. The point is—don't stop at handing a man a pay check. He's interested in other forms of

security for his family, old age or retirement.

Boost Team Spirit—This can be the forte of the smaller company that can't afford to back up top positions with several candidates. The idea here is to encourage the executive to identify himself with the company. Let him get on the "ins" of the business, both the bad and the good facts of the operation. Ask for, listen to and explain the whys of his suggestions.

Swartwout Co., Cleveland, has a double-barreled profit sharing plan in which it takes all its employees into the "know." Quarterly reports and yearly statements to employees are written so that all employees know as much about the financial condition of the company as the board of directors. Progress reports are given at each monthly union committee meeting and periodic executive letters are sent to employees' homes explaining all phases of the company's business. "It seems disconcerting at times," says D. K. Swartwout, president of the company, "to have to explain and justify a management decision. But, that's exactly what we're after—interest and suggestions for improvement."

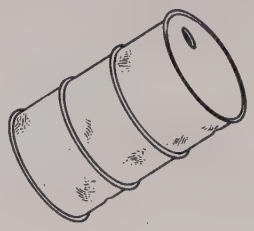
No plan will guarantee your holding all your top men. But, it's been abundantly illustrated by companies which have taken the above four steps that they help in doing so and often lead to other improvements.

Western Sights: On Top Income

"Nationally, the plateau of prosperity is growing higher and the West will lead all regions in participating in this wealth."

Charles R. Sligh, president of the National Association of Manufacturers, made that forecast. Indications that the West will be first in the future production of goods have been apparent during the last decade, he says. During that period the greatest increase in total income payments to individuals has occurred in seven western states. The rise in seventh-place California has been 202 per cent.

The center of gravity of the national market is swinging towards the Pacific Coast, he predicts. By 1975 the eleven western states may contain one-third of the population and a labor force of 10.7 million.



Used Steel Drums:

Reconditioners believe business will continue to be brisk this year

NEARLY AS MUCH material will be shipped in reconditioned steel drums this year as last if the estimates of leaders in this small-business industry run true to form.

The industry, which has been hitting the highroads ever since World War II, in 1952 reconditioned between 30 million and 40 million 18-gage, 55-gallon steel drums of both openhead and bung type. That constituted about 95 per cent of the business. The other 5 per cent was 16-gage, 55-gallon and smaller capacity drums. The total was more than twice the 16 million new steel drums produced last year.

Variations—Estimates within the industry as to 1953 volume vary, but nobody expects it to slide off much. Morris Hershson, president of National Barrel & Drum Association Inc., Washington, D. C., even optimistically predicts that "business this year will be as good as last year, if not a little better."

Small businesses, as defined by the Commerce department, make up virtually the whole industry. More than 300 companies are engaged actively in reconditioning, and another 100 or so "captive shops" are equipped to do such work but don't have full schedules.

Monopoly — Practically all used drums which are to be reconditioned end up in those 400 shops. Only about 1 per cent of them find their way to factories which make new drums, Mr. Hershson says. And few users clean and repair their own.

The practice of demanding deposits is almost a dead issue. During the war and the steel strike, many shippers tacked the price of a new drum onto the bill, thereby guaranteeing the return of the container. But now that new and used drums are available, the shipping costs, bookkeeping and handling expenses of such a practice often are more than the value of the drum itself. Only in certain industries, such as adhesives, is the practice maintained today.

It's Cheaper—The economics of using reconditioned drums is one of the big talking points of the industry. They cost from 20 to 30 per cent less than new ones, and, under normal handling, will give from six to eight trips. Another important consideration is freight rates. If the shipper certifies that the immediately preceding movement of the drum when filled was by railroad, the used drum can be rail-shipped at about 25 to 30 per cent less than a new one. That certification is often difficult for the reconditioner because he buys drums at remote points from many sources. So, if the shipping costs are prohibitive, the used drums are sold for scrap.

Generally speaking, however, the industry faces a secure future. Uses for their product are increasing. The four largest users of reconditioned drums probably are oil and lubricants, paints and related materials, chemical products and food products. Only in powdered goods are the steel containers losing any ground to fiber barrels, and most reconditioners do not believe that is serious.

Cost Cutting—The market is no longer tight as a drum head as it was in 1950-51, but the increased efforts to cut costs in most industries (see page 58) will assure reconditioners of a steady market.

Manufacturers stocks begin to rise again as . . .

Fastener Market Returns to Normal

Fastener makers find backlogs are dropping back to near normal levels. Sales continue strong to automobile, air conditioning and appliance makers; railroad sales lag

ADJUSTMENTS are on the way but business will not deteriorate [illegible]izably this year." So say makers of industrial fasteners, an industry which accounts for well over $500 million annual sales volume and ships 1.5 million tons of nuts, bolts and rivets a year.

"We've been used to tremendous backlogs, and are only getting back to normal as backlogs trail downward," explained one member attending the Industrial Fasteners Institute meeting at Rye, N. Y., last week.

Inventories Important—Delivery time on most fasteners has shortened; sales from stock are again becoming standard in some lines. Customers aren't ordering as far in advance as before. "Industry is becoming more inventory-conscious," says R. M. Smith, Pittsburgh Screw & Bolt Corp., Pittsburgh.

Railroads used to place orders for a year's supply of track bolts. Now they're ordering by the quarter. Large diameter bolts are still tight, as are some small sizes of fasteners. In diameters of 5/8, 3/4 and 7/8-inches and short bolts under three inches, producers are looking for business. These sizes go mainly into structural work and railroads.

Good Markets—Anyone supplying fasteners for the booming auto industry is enjoying a picnic today; other customers doing well are air conditioning, some appliances and segments of construction. "Our shipments and billings are good," says E. G. Wertheimer, Sterling Bolt Co., Chicago, maker of a wide range of fasteners.

Prices—Most bolt, nut and rivet prices went up 2 to 5 per cent following OPS' demise, but some producers still absorb a good proportion of the added price of materials in recent years.

If there are further increases in steel prices, fastener producers will be hard put to absorb them. Annual reports show few companies made out well financially last year. Increases in copper prices following decontrol sent copper and brass fastener prices up 7 to 12 per cent, says V. A. Spoehr, H. M. Harper Co., Morton Grove, Ill. Not all fastener prices are up.

Better Selling — At the Institute's meeting, President H. H. Lind warned members that "creative selling is needed for days not as flush as now."

Excellent acceptance of the "bonded stock" program for aircraft fasteners was reported. Under this system, government inspectors only audit inspection procedures and all production goes into stock to be inspected by batch. Formerly fasteners were inspected at producers' plants and at the aircraft plant. About 50 per cent of aircraft fasteners produced today are sold under this system; the Air Force considers the bonded stock program economical for the government and producers.

Officers re-elected at the meeting include H. H. Lind, president and J. D. Eggers, secretary-treasurer. F. R. Dickenson, Townsend Co., New Brighton, Pa., was re-elected vice president.

Coal Costs Are Steady

New mining techniques hold cost of coal level while equipment sales rise

NEW DEVELOPMENTS in mining equipment and technique should hold coal production cost nearly level while costs of most competing fuels are rising, predicts Julian D. Conover, executive vice president of American Mining Congress.

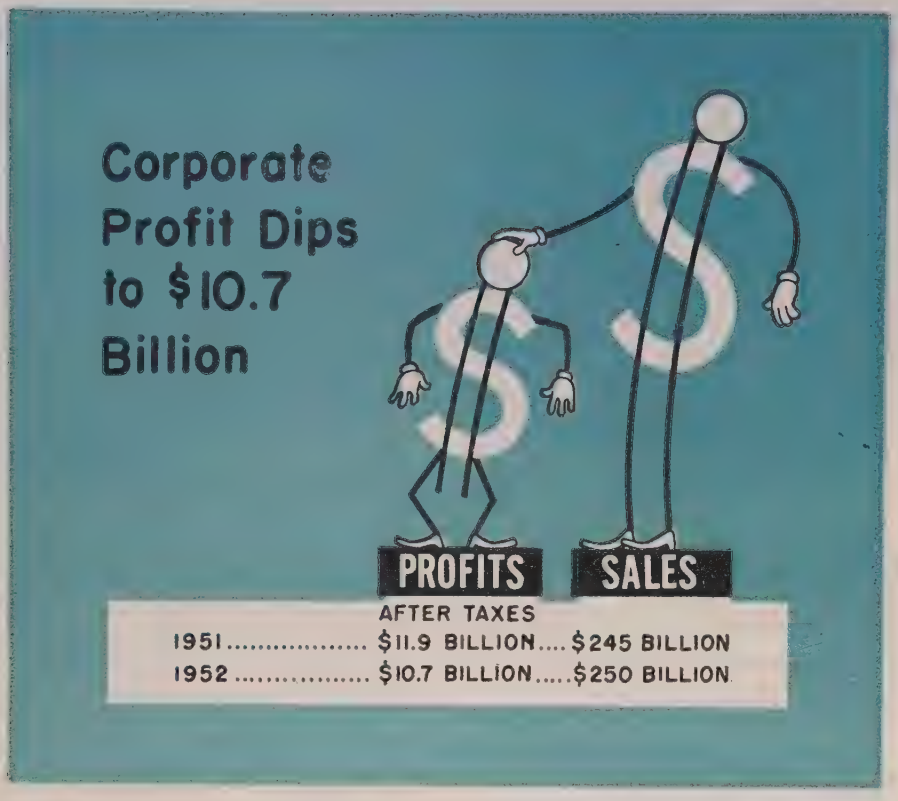
As AMC's 1953 convention and exposition began in Cleveland last week, estimates put annual equipment sales volume in the range of $4 to $5 billion. This includes new and replacement equipment, parts and operating supplies. The volume surpasses last year's total by more than $500 million.

No Escape—Mack H. Shumate, assistant general manager, Truax Traer Coal Co., Chicago, emphasized that coal must continue to expand its financial support to research and development programs. This will include searching for new machinery and maximum utilization of present equipment.

Continuous mining machines remain a big topic with underground operators. Although there are nearly 160 continuous machines in operation, their best utilization is subject to debate.

Topside—On the surface, use of modified armored plate steels for shovels and draglines is adding strength and cutting weight in numerous design applications. A convention speaker predicted larger truck haulage equipment, adding that his company was considering use of a new 100-ton model.

Nearly 10,000 coal mine operators, equipment builders and suppliers attended the four-day meeting. Exhibitors' displays covered more than 130,000 square feet in six exhibition halls.



PROFITS of manufacturing corporations after taxes declined to $10.7 billion in 1952, 10 per cent lower than in 1951, according to a report by the Federal Trade Commission and Securities & Exchange Commission.

Although sales reached a record high of $250.2 billion in 1952, rising 2 per cent above the previous year, profits before taxes dipped 16 per cent. In the fourth quarter of 1952, sales reached an all-time quarterly high of $67.5 billion.

Profits Increase—As shown by the chart, profits after taxes increased last year in the fields of electrical machinery, transportation equipment and motor vehicles and parts. The largest percentage declines were in iron and steel groups.

The governmental report estimates total assets of manufacturing corporations at $166 billion by the end of 1952, $7.8 billion higher than the total one year earlier. Net working capital was estimated at $55 billion, an increase of $2.5 billion, while net plant and equipment increased $5.2 billion during 1952.

Profits Dropped in 1952 in Most Industries

(Amounts in millions of dollars)

Industry Group	PROFITS BEFORE TAXES 1951	1952	Change	PROFITS AFTER TAXES 1951	1952	Change
Primary nonferrous metals	1101	871	—21%	522	461	—12%
Primary iron & steel	2654	1426	—46%	960	687	—28%
Fabricated metal	1415	1054	—26%	604	493	—18%
Machinery, except elec.	2778	2577	— 7%	1104	1044	— 5%
Electrical machinery	1686	1657	— 2%	608	635	+ 4%
Transportation equipment (except auto)	442	645	+46%	189	255	+35%
Motor vehicles & parts	2623	2569	— 2%	939	953	+ 1%
Instruments, etc.	445	424	— 5%	183	169	— 8%

Airframe Makers Vulnerable

Airframe manufacturers ar being forced into a vulnerabl position by the diminishing rat of profit on their sales dollars. S concludes the Aircraft Industrie Association in a financial survey of 12 companies, accounting fo 90 per cent of airframe weigh produced in 1952.

The airframe industry booste its 1952 sales 88.5 per cent ove 1951, but net earnings of $81. million is only a 2.2 per cent mar gin on sales. This 2.2 per cen rate of earnings makes a poo showing, says the association when compared with the 5.4 pe cent margin averaged by the 178 manufacturing concerns surveye by the National City Bank of Ne York.

Inventories owned by airfram companies now stand at 118.6 pe cent of net worth and 172.2 pe cent of working capital, well abov the 99.0 per cent and 139.6 pe cent relationship which prevaile between 1941 and 1946. Expan sion programs have raised the ne book value of plant to approxi mately 40 per cent over plant valu ation at the close of World Wa II. Most of these new facilitie were financed by the industry it self, in contrast to governmen financing in World War II. Goverr ment advances on Jan. 1, 195 amounted to $91.5 million, com pared with an average of $30 million in the 1941-1945 period.

The association says that thos heavy investments in inventory an new facilities represent risks tha may become serious if any sudde changes occur in the defense pro gram. Continued low earnings pe sales dollar wouldn't provide ade quate reserves to meet an eve modest loss in inventories or t keep up payment on the new facili ties.

Special Tools Needed

The special tooling industr must be kept in healthy shape the preparedness program is to b effective, warns J. J. Demuth former president of the America Society of Tool Engineers.

"Without active tooling facilitie the biggest reserve of machine too is useless," Mr. Demuth told th

nual trustees meeting of the National Tool & Die Manufacturers ssociation in New York.

To strengthen the tool and die ndustry, NTDMA's Government elations Committee is recommending the following procedures to e National Production Authority:

1. In granting certificates of ecessity, higher percentages of ie cost of new facilities should e allowed for five-year tax amorization.

2. When a military department rranges for a tool and die shop o receive a machine tool which rrives after work is completed on ie department's contract, the tool nd die shop may retain the tool if is needed for a defense contract rom another military agency and ay keep the tool for the duration f the emergency.

3. Supplies of new machine tools or toolroom use should be divided qually between civilian and defense producers.

4. Once a machine tool is scheduled for delivery to a tool shop, t should not be subject to diversion within 90 days of delivery.

Demand Increases for TV Tubes

Demand for electronic tubes in 1953 will surpass that of last year by between 20 and 30 per cent, but production may fall short of the goal because of insufficient supplies of nickel, members of the receiving tube industry and the special purpose tube industry told National Production Authority.

Telecasting facilities will account for much of the increased demand. Manufacturers say they need more solid nickel, nickel alloy and nickel plated wire, rod and strip, but their suppliers do not have it.

Lockheed Forms Research Group

Lockheed Aircraft Corp., Burbank, Calif., formed a development planning engineering and research group to determine what aviation will be like decades in the future.

Under the direction of L. E. Root, noted aeronautical engineer, the group will study aviation development; trends in power, speed and aircraft capacity; utilization of scientific knowledge and future weapons systems involving new types of airplanes and missiles.

STEELWORKERS are now earning seven times as much as in 1914, on the average. Hourly earnings stood at $2.16 in January, 1953, compared with an average of 30 cents in 1914, according to the American Iron & Steel Institute. The rapid rate of increase is shown by a jump of almost $1.00 an hour since 1945.

Pay Rate—As contract discussions between United Steelworkers of America and about 80 steel companies begin anew, workers on the average are receiving 43 cents an hour more than the average for all manufacturing industries ($1.73 an hour).

With substantial raises granted in 1952, this spread has become the widest ever recorded. Steelworkers have consistently received higher than average earnings; in 1914, their advantage was about 8 cents an hour and in 1939, 21 cents.

The steel union is characteristically slow to state its exact requests, but workers are expected to ask for a raise of about 16 cents an hour. Previous discussions have resulted in workers settling for about half of what they request. There will probably be no specific action until the end of May.

Cost of Living — While wages have been rising, consumer prices have climbed at a slower rate. AISI figures show that real average hourly earnings in the steel industry, in terms of 1947-1949 purchasing power, have risen from $.702 in 1914 to $1.411 in 1939 and $1.905 in 1953.

Higher wages are only part of increasing economic benefits for steelworkers. The institute reports that direct payroll items such as vacations, holidays and shift differentials cost the steel industry 24 cents an hour per employee on the average.

Extra Benefits—Pensions, insurance and other items paid by the employer and not reflected in the paycheck mount to an average 16.7 cents an hour per employee, AISI figures show.

Hourly Earnings in Steel Compared with Other Industries

Industry	AVERAGE HOURLY EARNINGS Year 1939	January 1950	January 1953	INCREASE 1939 to 1953
Blast furnaces, steelworks & rolling mills	$.84	$1.68	$2.16	$1.32
Automobiles	.93	1.72	2.08	1.15
Copper mining	.68	1.59	2.01	1.33
Bituminous coal	.89	1.93	2.48	1.59
Rubber tires & inner tubes	.96	1.76	2.22	1.26
Electrical machinery	.70	1.44	1.72	1.02

Source: U. S. Bureau of Labor Statistics

More Steel for Mid-American Users

The St. Louis area's two integrated steel producers, Granite City Steel Co. and Laclede Steel Co., expand their facilities, with Granite City Steel doubling its ingot-making capacity

MORE STEEL for mid-America is assured by expansion and improvement by the St. Louis area's two integrated steel producers, Granite City Steel Co. and Laclede Steel Co.

Granite City Steel Co., whose plants and main office are at Granite City, Ill., just across the Mississippi from St. Louis, will, by the end of this year, have doubled its ingot capacity in the last three years. It will reach 1.2 million tons, compared with 620,000 tons in 1950. In making this increase and accompanying improvements the company will have spent $68 million in 1951, 1952 and 1953. Its gross property account will have soared from $29.9 million at the end of 1950 to $95 million at the end of 1953.

Laclede Steel, with a steel ingot producing plant at Alton, Ill., upriver 20 miles from downtown St. Louis, and a rolling mill and fabricating plant at Madison, Ill., next door to Granite City, Ill., is enlarging its ingot producing facilities by 60,000 tons a year.

Broad Programs—To make effective use of the additional ingot capacity, both companies are improving other facilities also.

Granite City Steel replaced an ancient slabbing mill with a 46-inch blooming mill that began operating Apr. 2. The old slabbing mill had been a bottleneck in the production line between ingot production and finishing facilities. Expected to come into operation next July is a 4-high reversing mill that will replace an old 3-high reversing mill. Slabs coming from the blooming mill will be broken down in the reversing mill before going into a 5-stand, 4-high continuous hot strip-sheet mill.

New Heating Facilities—Also added by Granite City Steel are six three-hole soaking pits and three slab heating furnaces. Three new open-hearth furnaces, each with a capacity of 300 tons per heat, are to go into operation in May and June and will supplement the company's four 250-ton open hearths and nine 65-ton open hearths. The latter nine may become stand-by capacity, depending on market conditions. Also coming into production this month are 27 new coke ovens that will supplement the present 49 ovens. Other major items included in the company's expansion program are a new roll maintenance building and a hot strip shear line.

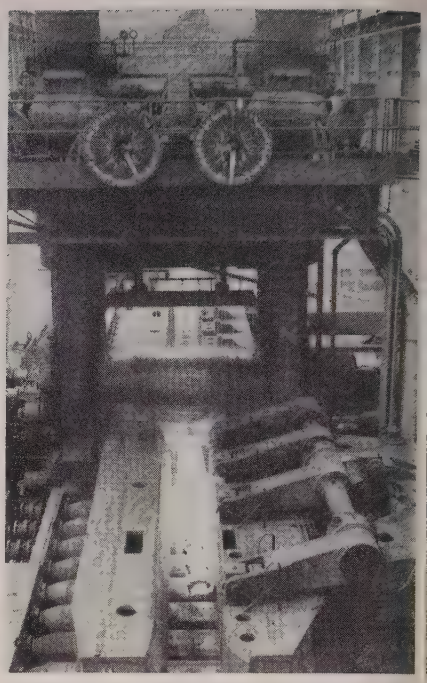
Upon completion of its expansion, Granite City Steel's production facilities will be in balance for the first time.

Getting Water Route—Reflecting the growth in the mid-American steel consumption and the importance attached to water transportation, Granite City Steel late this year will be able for the first time to ship steel by barge from Granite City. Water transportation is becoming available because the federal government is constructing a 7½-mile diversion canal bypassing a bend in the Mississippi river and touching Granite City. The company not only will utilize water transportation to haul away new steel but also to carry in raw materials.

Another example of the growing importance of river transportation will be the construction soon on riverfront property at Memphis, Tenn., of a construction products fabricating plant for Laclede Steel. It is expected to be completed early next year.

At its Madison, Ill., fabricating plant, Laclede Steel just started to make steel joists.

Electrifying—At its Alton, Ill., steel plant, Laclede is replacing the blooming mill's steam drive with a 5000-horsepower electric reversing motor. Upon completion in July the new drive will raise the blooming mill's capacity from the present 40,000 tons of ingots a month to 65,000 tons. Hydraulic manipulators on the blooming mill are being replaced with electric manipulators.



AT GRANITE CITY STEEL
. . . new bloomer breaks bottleneck

Expanded—At the Alton plant the two smallest of four open hearths are being enlarged. This will raise open-hearth capacity 5000 tons a month.

Contributing toward production increases at the Alton plant will be improvements in equipment for handling raw materials.

Granite City Steel and Laclede Steel are not in competition with one another. The former is principally a producer of flat-rolled steel and the latter makes bars, wire, tubular goods and construction products.

Steelmen To Discuss Supplies

A panel of steel mill executives will discuss current and future supply conditions at the 44th annual meeting of the American Steel Warehouse Association in Washington, May 24-26.

Steelmen participating are J. V. Honeycutt, Bethlehem Steel Corp., Bethlehem, Pa.; Logan T. Johnson, Armco Steel Corp., Middletown, O.;

F. Smith, Inland Steel Co., Chicago; Carl L. Huff, Bliss & Laughlin Inc., Harvey, Ill., and Norman J. Foy, Republic Steel Corp., Cleveland.

Wilson Submits Budget

Military income-outgo won't balance in 1954-55, but he proposes to bring it more in line

DEFENSE SECRETARY Charles E. Wilson told the House Appropriations military subcommittee that the administration this summer and fall will take a complete "new look" at the "entire defense picture" and may come up with far-reaching changes.

In presenting the committee with his cutback program for fiscal 1954, he said that a joint study just completed by the Pentagon and the National Security Council revealed that a complete budget balance for the military could not be attained during fiscal 1954 and 1955 "without seriously reducing the rate of build-up of our national defense program."

Seven-point Program—However, he said "that by careful review and balancing of our military effort, important progress could be made in reducing deficits and bringing expenditures and revenues into reasonable balance within the next two or three years." The budget request submitted by Secretary Wilson proposes seven steps in that direction.

1. Cut armed forces strength to 3.3 million by June 30, 1954, if the Korean war ends and to 3,356,000 if it is still on.

2. Hold actual military spending to $43.2 billion next year.

3. Fix an interim goal of 120 wings for the Air Force, with 114 wings to be active and "substantially equipped" by June 30, 1954.

4. Retain the $500 million for reserve machine tools and facilities asked in the Truman budget, to be "obligated only after careful study."

5. Provide for an Army of 20 divisions, 18 regimental combat teams and 117 antiaircraft battalions. Cut Army personnel from 1.5 million to 1,421,000 if the Korean war doesn't end and 1,370,000 if it does.

6. Maintain the 408 ships now in the Navy but reduce personnel from 800,000 to 745,000. Keep three divisions and three wings in the Marine Corps but reduce personnel from 245,000 to 230,000. Maintain 9900 operating planes in Navy and Marine aviation.

7. Cut back Air Force personnel from 970,000 to 960,000 next year and decrease to 915,000 the following year.

More Push-Pull for the Army Engineers

Tractor-of-all-trades, this rubber-tired Goliath of the U. S. Army Corps of Engineers is designed for bulldozing, operating scraper equipment and use as a prime mover. Engineering and construction of the overgrown vehicle were done by Allis-Chalmers Mfg. Co. at the Cedar Rapids, Iowa, works

Break Ground for New Stack

More adequate supply of merchant pig iron for foundries and other consumers in the Cleveland area will be supplied by American Steel & Wire Division's new 1350-ton blast furnace. Ground was broken May 12 at Cleveland and the stack will be completed in about a year.

Much of the output from the new furnace will go to the new Ford foundry at Cleveland.

CHECKLIST ON CONTROLS

Defense Materials System

NONMILITARY ORDERS—Direction 2 to Defense Materials System Regulation 1, issued and effective May 11, 1953, allows controlled materials producers to ship carryover nonmilitary orders for steel, copper and aluminum at any time before Oct. 1, 1953.

Materials Order

INDUSTRIAL DIAMONDS—Revocation on May 12, 1953, of NPA Order M-102 removed all control over crushing bort, diamond powder or dust and unreclaimed diamond material.

Appointments in Washington

John Slezak, president, Turner Brass Works, Sycamore, Ill., and James P. Mitchell, vice president in charge of operations, Bloomingdale Bros. Department Store, New York, were confirmed by the Senate as assistant secretaries of the army.

Warren Eberly, Carpenter Steel Co., Reading, Pa., was appointed chief, High Temperature Alloy Section, Iron & Steel Division, National Production Authority.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $1000,000

PRODUCT	CONTRACTOR
Fuze Sleeves	New Britain Machine Co., New Britain, Conn.
	Weatherhead Co., Cleveland
Radio Communication Systems	Western Electric Co. Inc., New York
Antenna Assembly	Henry Products Co., Brooklyn, N. Y.
Locomotive, Diesel	Plymouth Locomotive Works, Plymouth, O.
Lathe, Turret Engine	Gisholt Machine Co., Madison, Wis.
Carburetors	Bendix Aviation Corp., South Bend, Ind.
Percussion Primer	Trifari, Krussman & Fishel Inc., Providence, R. I.
Signal, Flash and Sound	Bayshore Industries Inc., Elkton, Md.
Adapter, Grenade Projection	George K. Garrett Co., Philadelphia
Booster, Metal Parts Assembly	Columbia Electric & Mfg. Co., Spokane
Pumps	Worthington Corp., Harrison, N. J.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

United Press

Advisers to the President Join for Official Photograph

Sitting for an official portrait are the President's top advisers. Seated clockwise around the table are: Henry Cabot Lodge, chief U. S. representative to the U. N.; Douglas McKay, secretary of the interior; George M. Humphrey, secretary of the treasury; Vice President Richard Nixon; Herbert Brownell, attorney general; Sinclair Weeks, secretary of commerce; Oveta Culp Hobby, secretary of welfare; Sherman Adams, assistant to the President; Joseph M. Dodge, budget director; Arthur S. Flemming, acting defense mobilizer; Martin Durkin, secretary of labor; Arthur Summerfield, postmaster general; John Foster Dulles, secretary of state; President Eisenhower; Charles Wilson, secretary of defense; Ezra Benson, secretary of agriculture and Harold Stassen, mutual security director. Standing are Philip Young, left, civil service chairman and Robert Cutler, assistant on national security affairs

The administration policy of raising interest rates to combat inflation stirs a Washington controversy. Protests loom up from Democrats in Congress

FIRST serious opposition to the new administration's policy of raising interest rates as an anti-inflationary device to "restore" the purchasing power of the dollar occurred in a resolution introduced in the Senate and the House on May 11 by seven Democratic senators and 13 Democratic representatives.

Pointing out that the prices of long-term government securities have fallen to "a new historic low" because of the refusal of the Federal Reserve system to support the market, the legislators would require the Federal Reserve to "support American securities at par."

Lending Policy — This action would enable the government to borrow at lower interest rates. The Democrats say this in turn "would permit lower rates for farmers, businessmen, home buyers, local governments and other borrowers."

Inasmuch as some Republicans already have protested against the trend toward higher interest rates, and with a likelihood that many interested minority groups will seek a reversal of this trend, considerable controversy seems certain even though the Republican leadership in the two houses will probably succeed in obtaining majority support for the administration course.

Dangerous Rates — Spokesmen for the group, Sen. James E. Murray (Dem., Mont.) and Rep. Wright Patman (Dem., Tex.), see the higher interest rates as increasing the cost of carrying the national debt and threatening "future depressions, foreclosures, bankruptcies and unemployment."

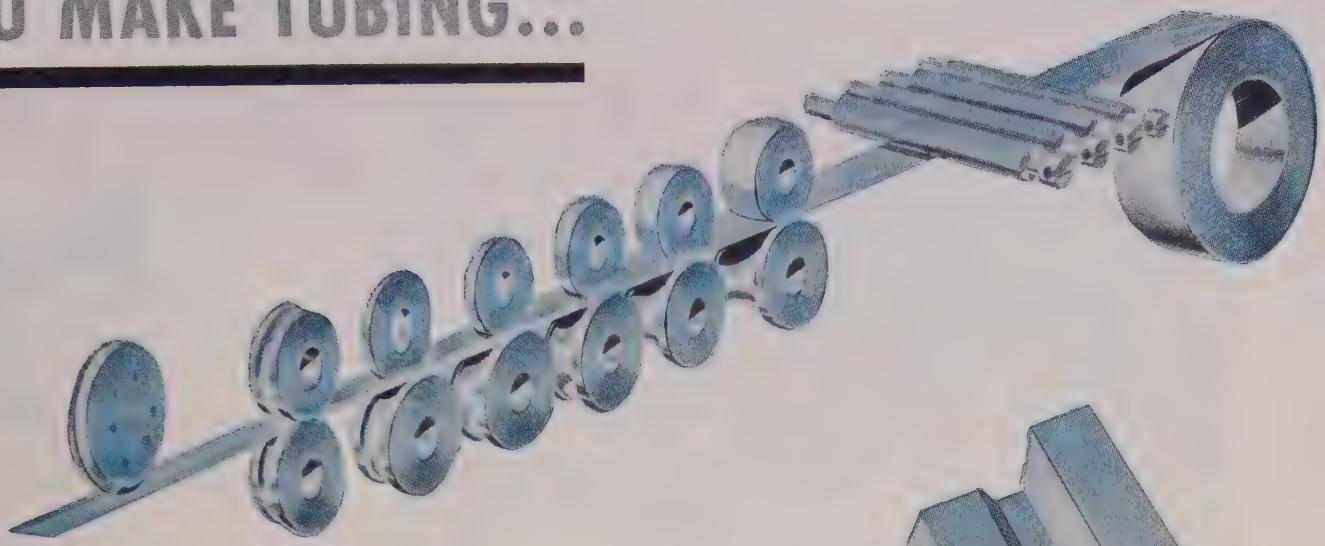
First rise in interest rates was reflected on support loans to farmers and on Export-Import Bank loans for the purchase abroad of American cotton. Then came an increase in the commercial bank rate on business loans. This was followed by a rise in rates on consumer installment loans. Since then the interest rates on Veterans Administration and Federal Housing Administration insured home mortgages have been boosted.

Predict $5.9 Billion Deficit . . .

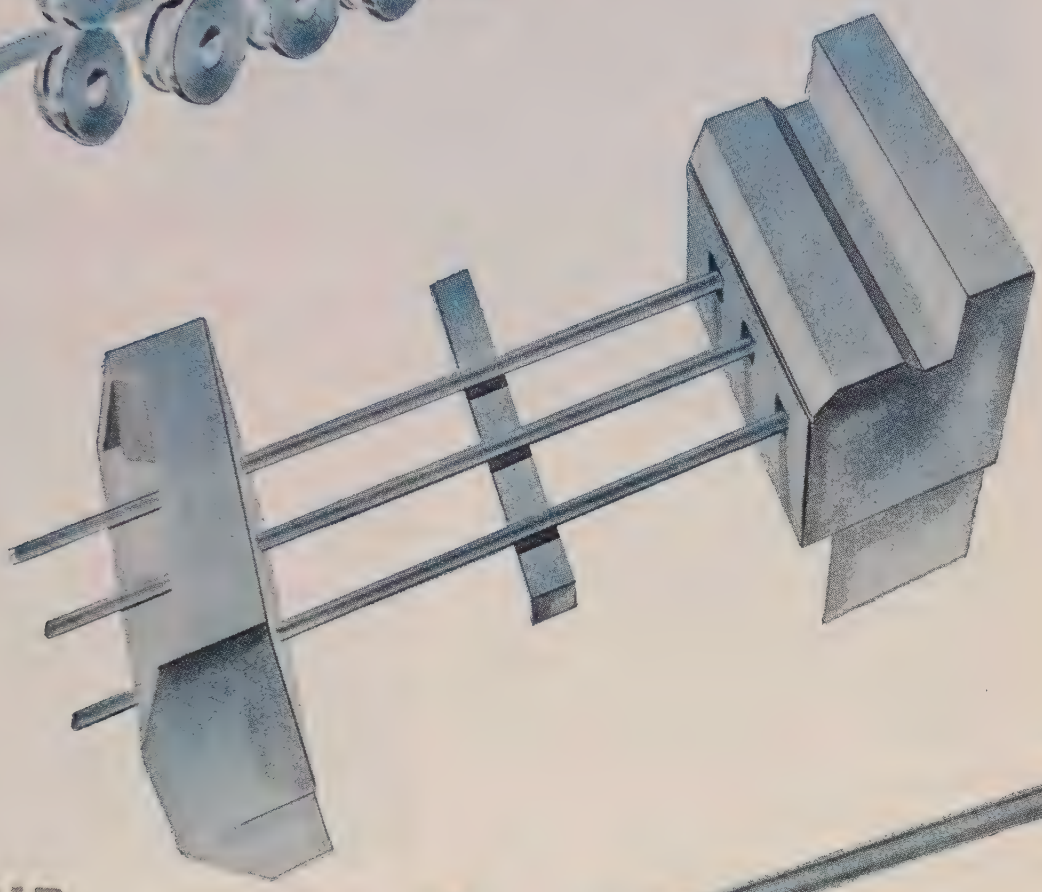
An analysis by the staff of the Joint Congressional Committee on Internal Revenue, headed by Rep. Daniel A. Reed (Rep., N.Y.), predicts that the Treasury will end the fiscal year ending June 30, 1954, with a deficit of $5.9 billion, as against the $9.9 billion deficit implied in the Truman budget.

The analysis, which coincided largely with expectations of Treasury secretary George Humphrey, is expected to add to congressional opposition to cuts in income taxes under present conditions. Present strategy of the Republican leadership is to postpone tax-cut legislation until next spring—in advance of the November elections.

OU MAKE TUBING...



AW IT...



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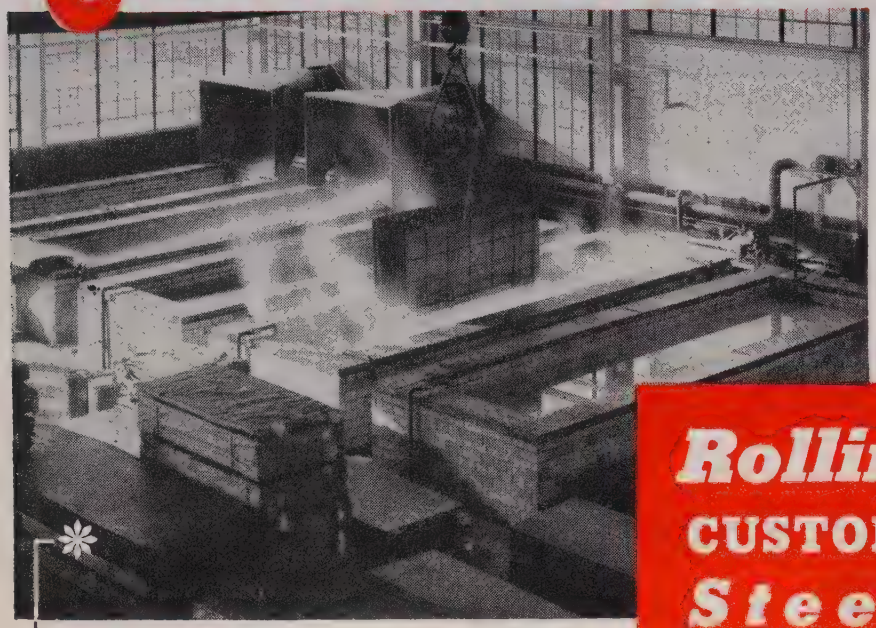

Pickling tanks in our Seneca Buffalo warehouse are shown above. All 3 of our plants, Detroit, Chicago and Buffalo, are equipped with the latest type cross-ventilated tanks to give you fast delivery of pickled and oiled steel in sheets, plates, bars and coils (cut to length if desired).

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* Steel strips in coils and cut lengths . . . restricted tolerances, all tempers and finishes.
* Warehouse stocks in sheets, plates, coils and cut lengths . . . all tempers and finishes.

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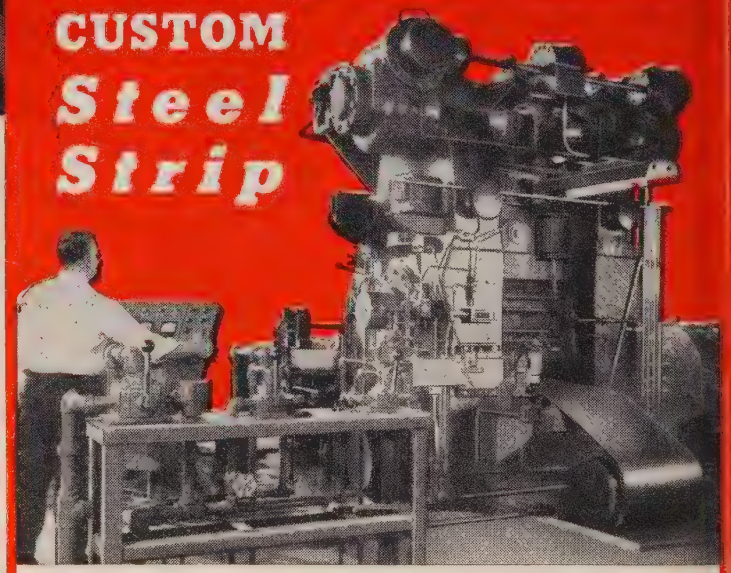

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Tony Canadeo, Sales Representative

U.K. Imports-Exports Improve

First quarter, 1953, shows gains over the first quarter a year ago. Price is the British ace-in-the-hole. Steel plates remain a serious bottleneck

E CONTINUING shortage of el plates in England has led to formation of a British con- tilled materials plan for this steel oduct. The Minister of Supply s a group of plate producers will as a clearing house for consum- demands and a governmental mmittee will determine priorities. n the last twelve months produc- n of plates rose from 40,000 to 000 tons a week. This year, out- t should reach about 2.4 million s or nearly 200,000 tons better an in 1952. Still shipyards and ilroad rolling stock builders com- ain they are suffering from lack sufficient steel.

Exceptional — The shortage of ates sticks out as the sole excep- on to generally improving steel pply. Consensus in England is at general rationing of steel will ended before the end of June.

Steel production gains are atched by rising steel exports. on and steel and manufactured oduct exports totaled 226,775 ns in March, 1953, compared with 8,368 tons in February, 1953. A mparison of the first quarter, 953, and first quarter, 1952, comes p with 1953 still on the plus side— 54,583 tons in 1953, 644,593 tons 1952.

Imports Up, Too — The British erolling trade is operating at full apacity thanks to greatly im- roved imports of steel. In Febru- ry, 1953, 24,343 tons of blooms, illets and other semifinished steel roducts came into England com- ared with 4676 tons for the same month last year. Total imports of iron and steel in February were 146,135 tons of which 21,997 tons came from the U. S. and 16,718 tons came from Belgium.

Even with the easing of the world wide shortage of steel and the resultant decline in prices, British steel is favorably priced (see table below). U. K. steel producers and fabricators are again a factor to be reckoned with in competitive markets.

U.K. Steel Plant Expands

Dorman Long & Co., one of Great Britain's leading iron and steel makers, has begun the third stage of its development program. This stage involves spending about $101.5 million while the preceding steps cost about $39.5 million. Nearing completion is an open-hearth steel plant at Lackenby. A universal beam and heavy section mill with an annual output of 400,000 tons of rolled products is to be added there. Also a fifth open hearth, bringing the plant's annual capacity up to 650,000 tons of ingots. Two 27½-foot blast furnaces with a combined capacity of 750,000 tons of pig iron a year will be constructed plus a new coke oven plant at Cleveland, England, to carbonize 1.3 million tons of coal a year.

U.S. Defense Order for Britain

The English Steel Corp. has an order for large castings to be produced for an American defense plant. The castings—weighing up to 170 tons—will be larger than any produced in Great Britain before. The order was placed under an agreement with the General Steel Casting Corp. of America, Granite City, Ill.

Wide World

Blowing Hot and Heavy

A new blowtorch of German design sprays molten metal under air pressure. Zinc is used for an undercoat with a finish coat of hydronalium, an aluminum alloy. The tool has a built-in flame nozzle, similar to that of an oxyacetylene torch

Brazil Intends To Pay Up

A $300 million credit from the Export-Import Bank to the Banco do Brasil to assist Brazil in liquidating past due U. S. dollar accounts has been formally signed up. In supplementing the credit with its own resources, Brazil is attempting to become current on its U. S. dollar accounts by July 1, 1953, and to institute a prompt payment system for present U. S. imports.

Belgian Steel Output High

March output of steel was 445,500 tons for Belgium this year. That's some 99,000 below capacity for the Belgian steel industry but well above the prewar level of 275,000 (average of 1936-38). On the Belgian export market, Germany and the Scandinavian countries are still ordering in good quantities. Thin sheets are particularly in demand.

DOMESTIC STEEL PRICES

Long Tons—Open-Hearth Grade

	U.K.	U.S.	Germany
Angles	$80.65	$103.78	$117.03
Joists	$80.93	$102.65	$111.11
Rails	$82.49	$ 90.24	$112.24
Plates	$91.51	$104.90	$133.67

Source: British Iron & Steel Institute
Prices as of March, 1953, based on one pound sterling equivalent to $2.82

When the cost of manufacturing goes UP...

53% expect an increase*

(21% expect a decrease, 26% no change)

And distribution and sales costs go UP...

50% expect an increase*

(5% expect a decrease, 45% no change)

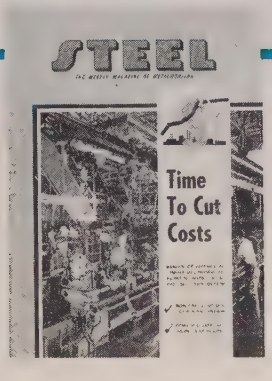
And selling prices remain the SAME...

47% expect no change*

(35% expect an increase, 18% a decrease)

what happens?

* According to a STEEL survey of 1152 top metalworking executives.



Industry Takes a New Look at COST-CUTTING . . .

ARE YOU reducing your production costs to offset rising labor and materials costs? If not, you may be in trouble soon.

Cost-consciousness in metalworking has been dulled by 12 prosperous years, with heavy defense orders. As the table above shows, industry will have to watch costs closely this year. Expiration of the excess profits tax on June 30 will give greater incentive to trimming unit production costs.

New Trend—R. C. Somerville, vice president of Chrysler Corp., Detroit, in charge of Dodge sales, remarked, "Men in the automotive industry have referred to competition 'ahead,' but it no longer is ahead. Intense competition is here already."

Industry has a double problem. V. R. Bechtel, budget director of American Cyanamid Co., New York, states that cost-cutting to meet competition must be done while paying high wages and taxes. A fair profit must be left to pay dividends and permit efficient maintenance of plants while carrying out extensive research.

Large Assignment—"Companies that do not recognize the task of producing more and better goods and getting them into the hands of consumers at prices they are willing to pay will watch their competitors take home the bacon," Mr. Bechtel continued.

"How can we cut costs to survive this competition?" management asks. STEEL's accompanying checklist on cost-cutting indicates directions of their investigations.

Where To Look—Thrift in industry is a frame of mind extending through all phases of production. "First step in cost control should be for management to learn exact production costs," says E. H. Anderson, management consultant of Harold F. Howard Co., Detroit. "Many companies are in a dangerous financial condition because their true costs are unknown to them," he continues, recommending a regular cost control report (STEEL Oct. 27, 1952, p. 53).

Standard Costs—At the Neville Island, Pittsburgh, plant of Pittsburgh Coke & Chemical Co., a committee composed of the plant superintendent, plant manager, works controller and cost accountant sets up standard costs for each operation. Reports are circulated to all departments, showing where costs are out of line.

Besides general cost-hunting, a good specific place to look for cost-cutting possibilities is in handling and storage of materials. Tiffin Art Metal Co., Tiffin, O., for example, was able to use the services of about 20 men for more productive purposes by renovating its handling of steel sheets.

Waste Materials — Allied with the problem of handling material is disposal of waste products. John T. Kiley, president of James Fleet Organization Inc., Chicago, says: "In a very high percentage of industry, in-plant handling of waste material is sketchily organized. More often than not, this is assigned to janitors with little or no established procedure. The result is needless mingling and contaminating of materials which are of considerable value when kept in segregated condition.

"Management should engage a

ganization of waste material cialists—one that devotes its re time to waste material in- nt handling and sale."

Quality Control — C. W. Ken- y, quality control engineer of eral Products Corp., Provi- ce, R. I., says, "There is streak of lean loss in most plants t can be converted into fat prof- " This loss, he added, can be ected through quality control l consists primarily of outsize rk or scrap, salvage and un- essary secondary operations, d it runs from 5 per cent to 30 r cent of total production costs.

L. S. Cooke, New England dis- ct engineer of General Electric ., reports that a planned light- g maintenance program at Hath- vay Mfg. Co., New Bedford, ass., saved at least $425 yearly ile providing an average of ap- oximately 25 per cent more il- mination. The program included nnual cleaning and group re- acement of lamps.

At E. I. du Pont de Nemours & o. Inc., Wilmington, Del., a com- ehensive cost reduction program securing better engineering per- rmance. The Du Pont engineering epartment began by identifying elds in which costs could be re- uced: Internal operating costs, ermanent investment, working apital and operating costs of con- umers.

Specific Savings—By standardiz- ng types and design of equipment, pare parts inventories were re- luced. Engineering studies de- signed to improve power factors cut costs of purchased power. Stud- es of lubricants helped to cut main- enance costs. Reviews of materials handling methods showed areas for utilization of conveyor equipment. Concerted effort to cut time for de- velopment and construction of new plants trimmed the time lag before such plants could yield a return on the investment.

Worker Efficiency — Are you getting maximum efficiency from your workers? Parker Pen Co., Janesville, Wis., realized reduced service and production costs and improved customer acceptance and safety rates by simulating "pro- prietor-mindedness" in its em- ployees. Biweekly meetings with workers helped give them a sense of responsibility for plant opera- tions.

Modernizing your equipment is another major way to cut costs. But paradoxically, that expensive modernization—necessary as it is —gives rise to still more pressure to keep costs down. Since 1946, industry has steadily increased its capital expenditures, to such an extent that they reached a $26.5 billion peak in 1952 and will climb still higher this year. That means that fixed costs are rising steadily and must be offset by stricter cost hunts. Many reductions in ex- penses can be found from the very new machinery that's boosting your fixed costs.

For Example — Indirect labor charges may be trimmed by invest- ment in new machine tools, Na- tional Machine Tool Builders' As- sociation reports. A Detroit auto- mobile manufacturer, installing new tools, realized savings through greater safety, with lower rates for workmen's compensation, by eliminating a production bottleneck, by combining operations of several machines and by reducing in-proc- ess inventory from faster flow of materials.

"Cost control is one of manage- ment's principal tools as well as a large responsibility in years ahead," Mr. Bechtel says. "Private enterprise will survive only if man- agement recognizes the problem. No department or function can be immune from constant review from a cost control viewpoint."

To Cut Costs, Check Here

- Is your plant laid out to get the most out of each man, ma- chine and department?
- Are you directing your re- search efforts to reduce aver- age unit cost of production?
- Is your plant lighting contri- buting to maximum production efficiency?
- Does your plant suggestion system bring in cost-cutting ideas?
- Do you have an active re- equipment program that as- sures maximum production at minimum unit cost?
- Do you use motion and time studies to help trim needless operations and save time?
- Do you circulate a monthly cost control report to super- visors in each department, showing deviation from stand- ard cost?
- Have you applied modern handling techniques to cut non- production costs wherever pos- sible?
- Are you careful to avoid loss of small tools?
- Do you have a preventive maintenance program to re- duce machine downtime?
- Is your accident rate declin- ing?
- Are you taking full advantage of efficient waste (including scrap) disposal methods to hold unit production costs to a mini- mum?
- Is efficient storage of mate- rials paying off in faster han- dling?
- Does your production control system contribute sufficiently to higher production rates at low- er unit costs?
- Do you have a wage incentive system that will measurably in- crease your employees' produc- tivity?

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by FLOYD G. LAWRENCE *Detroit Editor*

Mirrors of Motordom

The auto owner's yen for chrome trim is proving a bonanza for molding makers. Some eight or ten new ones have joined the three who were the major prewar suppliers

DETROIT

"WE'RE BEGINNING to think that garnish molding could give customer appeal to an outhouse," remarked one auto stylist recently in lamenting the current mode of boxlike body design. "There are already millions of the garnish molding cars on the road," replied one of his colleagues.

Big Business—But despite what many critics may think of the current school of body design, the molding makers love it. And while the hot rod boys toil in dimly lit garages to "dechrome" their throttle wagons, roll forming machines are turning out lengths of the scorned stainless steel decorative molding at speeds up to 1200 pieces an hour. Dechromed bodies or not, the garnishing of Harry Horsepower's automobile has given rise to a lively business.

Before the war most auto molding was produced by Herron-Zimmer Co., Ainsworth Mfg. Co., and Motor Products Corp. Their forte was the carbon steel drip molding which acquits its existence even today by preventing a cascade of water down the side of the automobile when it rains.

Vigorous Newcomer—But drip moldings today account for only about 50 per cent of automobile molding manufactured on a tonnage basis, and less than 30 per cent on a piece basis. The vigorous newcomer on the automobile molding scene, garnish molding, accounts for over 70 per cent of the molding pieces shipped to automobile manufacturers and the trend is still up.

With this growth in chrome trim sales have come eight or ten new companies on the molding scene, for the business does not require a great deal of costly equipment. Strips of stainless steel are fed through roll-forming machines and cut to predetermined length as they emerge. Next they are taken to presses where the ends are formed and crimped, and finally they are bent to shape in forming fixtures. After a polish and buff they are given a chrome flash and are ready for shipment to the automaker for direct installation on the car body.

Utility—Not all garnish molding is purely decorative. Rub strips at the door bases and along the sides of the car at knee level serve to protect the body of the car from damage in parking next to curbs and from opening doors of adjacent cars in parking lots. And if the walls of the garage should conspire to bump the car while Mrs. Horsepower is backing out, the result is frequently unnoticed thanks primarily to garnish molding.

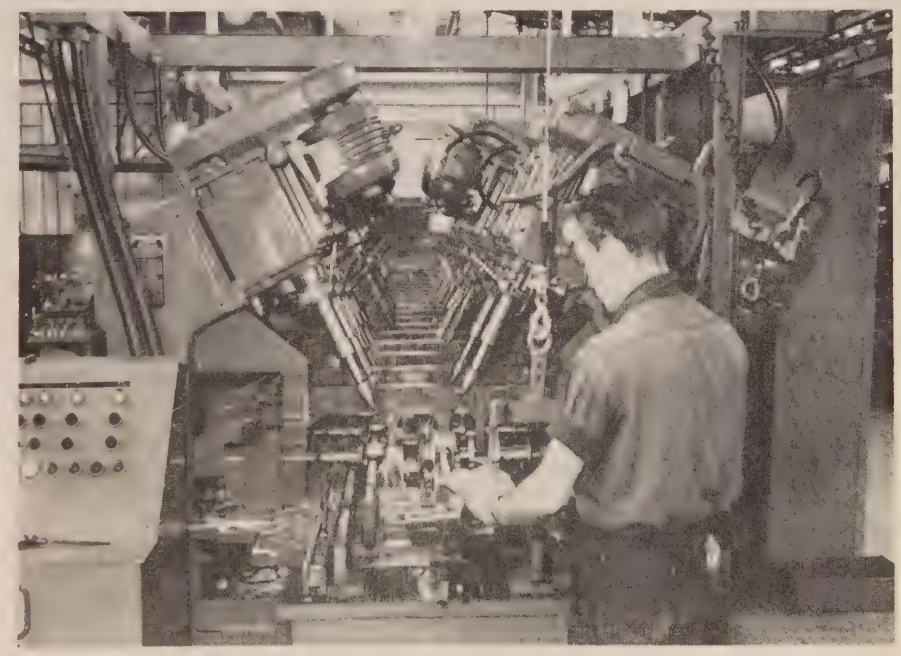
Stylists still object to the chrome trim, maintaining that the body of the auto should be sculptured in such a fashion that the lines themselves convey the effect desired. But automakers have tried dechromed cars ad nauseam and the result is always the same—no sale, or if the car sells somebody comes out with chrome "dress-up" ornaments and makes a mint. Frequently the automaker himself must come out with the chrome condiments to furbish his sales.

Cars in 1954 promise to be even more chromish than ever before as the sales picture threatens to dim and automakers pull out all the known enticement stops. And if sales fall too far, who knows, they may just chrome plate the entire automobile body and paint on the trim.

Ford at Fifty

In anticipation of its fiftieth anniversary come June 16, Ford invited a group of newsmen to see its engineering and testing facilities recently. One of the major exhibits was Ford's current work in turbine research.

In its present state of research, the turbine consists of two turbine



Automatic Operation at DeSoto

DeSoto Division of Chrysler Corp., Detroit, uses an automatic transfer machine with progressive drilling to drill crankshaft oil holes and pin-bearing lightening holes. As there are eight oil holes in the crankshaft and four drillings are required to complete a hole, there are 32 drill heads on the machine

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Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	747,142	525,024
April	780,491	570,464
May		542,559
June		542,478
July		226,134
August		322,755
September		595,715
October		656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Apr. 11	176,782	123,180
Apr. 18	162,171	131,657
Apr. 25	194,610	134,141
May 2	184,800	123,385
May 9	182,123	130,509
May 16	185,000*	129,914

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary

wheels, one driving the compressor and the other driving the car. The big problem at the moment is not to make a turbine that will work, but to find materials which will make the cost of the turbine low enough to permit its utilization on conventional cars. One estimate of the current cost of a turbine is about $20,000 owing to the large amounts of cobalt and other expensive metals involved.

With an eye to reducing the cost, Ford is currently experimenting with ceramic-metal bonding. The theory is to combine the heat resistance of the ceramic material under turbine operating temperatures of 1500 degrees F with the resiliency of metal. The finished product is a metal interlacing permeated with ceramic particles, and toward this end the "wetting" or bonding characteristics of various metals are currently being explored.

Performance of the turbine car, if the Rover which has been operating in England since 1950 may be taken as a criterion, will be phenomenal. The Rover gets from 0-60 from a standing start in 6.5 seconds, about one-third the time it takes your favorite wagon, and 0-100 takes only 13.5 seconds. The turbine idles at 15,000 rpm and turns up 45,000 rpm at its full rated 240 horsepower. The exhaust gases are cooled quickly by expansion and directed straight up into the air at the rear of the car to prevent burning the hose off ladies waiting for busses.

The technique in accelerating the Rover is of interest. When you pull up to a traffic light, merely hold the car with the brakes while you rev the turbine up to 45,000 rpm. When the light turns green, off you go like a cork out of a champagne bottle on New Year's Eve.

The car is reported to start readily under hot or cold conditions using a flutter spark to ignite the mixture initially, and in its present state of development gives about 9 miles per gallon on kerosene.

Hold on to your hats, for when the cost answer is found, Ford is making no bones about its attitude toward turbines. The turbine is coming with prototypes for publicity slated for sometime next year, according to grease monkeys in the pool room.

Car of the Week

The DeSoto Fire Dome V-8 stacks up as an ideal car for the solid, middle - class American car - lover. With fluid-torque transmission the car gets in and digs in a manner that puts a warm glow in your rear view mirror. On the open road the engine boots the car around 50-60 mile an hour, road hogs with aplomb, and is steady as a rock on up the clock farther than anyone should have driven a brand new car.

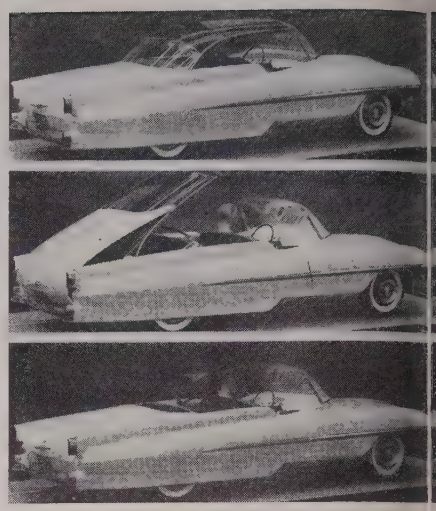
Comfort in the DeSoto is outstanding and visibility is good except at traffic lights where a light-finder would solve the problem. The interiors are a pleasing blend of modern-conservatism and somehow the walnut-grained dash is refreshingly cool. The leather-grained top of the dash prevents glare and makes a handy shelf for pipe, sun glasses and what have you.

DeSoto has intelligently reduced its steering ratio to take advantage of the increased torque provided by power-steering and gives a sense of positive control that not only inspires, but justifies confidence. Critics have been saying that in the event of power steering failure, the shift to conventional steering would be too much for the driver to adjust psychologically. In an experiment that probably proves nothing, the car was dropped into neutral at 60 miles an hour and the engine turned off making the power steering inoperative. The difference was noticeable, but scarcely more, and the adjustment should be made under failure conditions easily enough.

Power brakes on the DeSoto, as on other makes of cars tested, show a lag in release that should make fanning the brakes difficult on slippery pavement. Suspension on the DeSoto, while providing a soft ride, exhibited a body roll and tire squeal under normal cornering around town which tended to make the car seem somewhat ponderous.

Quality of manufacture in the DeSoto rates high. Door, hood and rear deck fit were good and the body finish was excellent. Behind the DeSoto body is one of the most modern body lines in the auto business. Engine manufacture is noteworthy as well.

All in all, the DeSoto combines much of the comfort and quality of the Chrysler with the nimbleness of the Dodge, adding a note of modern-conservatism all its own that puts one of the few functional hood air scoops in the industry right in style.



Ford's Hardtop Design

Ford Motor Co. displays its new hardtop convertible sedan design. Named the Syrtis, this model demonstrates an all-steel top which is lowered below the rear deck lid by an electric motor

ELECTRIC FURNACE STEELS
ARISTOLOY STEEL
STANDARD STRUCTURAL ALLOY • BEARING QUALITY
ALLOY TOOL • SPECIALTY • NITRALLOY • CARBON TOOL • AIRCRAFT QUALITY
Hot Rolled • Forged • Annealed • Heat Treated • Normalized
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COPPERWELD STEEL COMPANY
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ARISTOLOY STEELS

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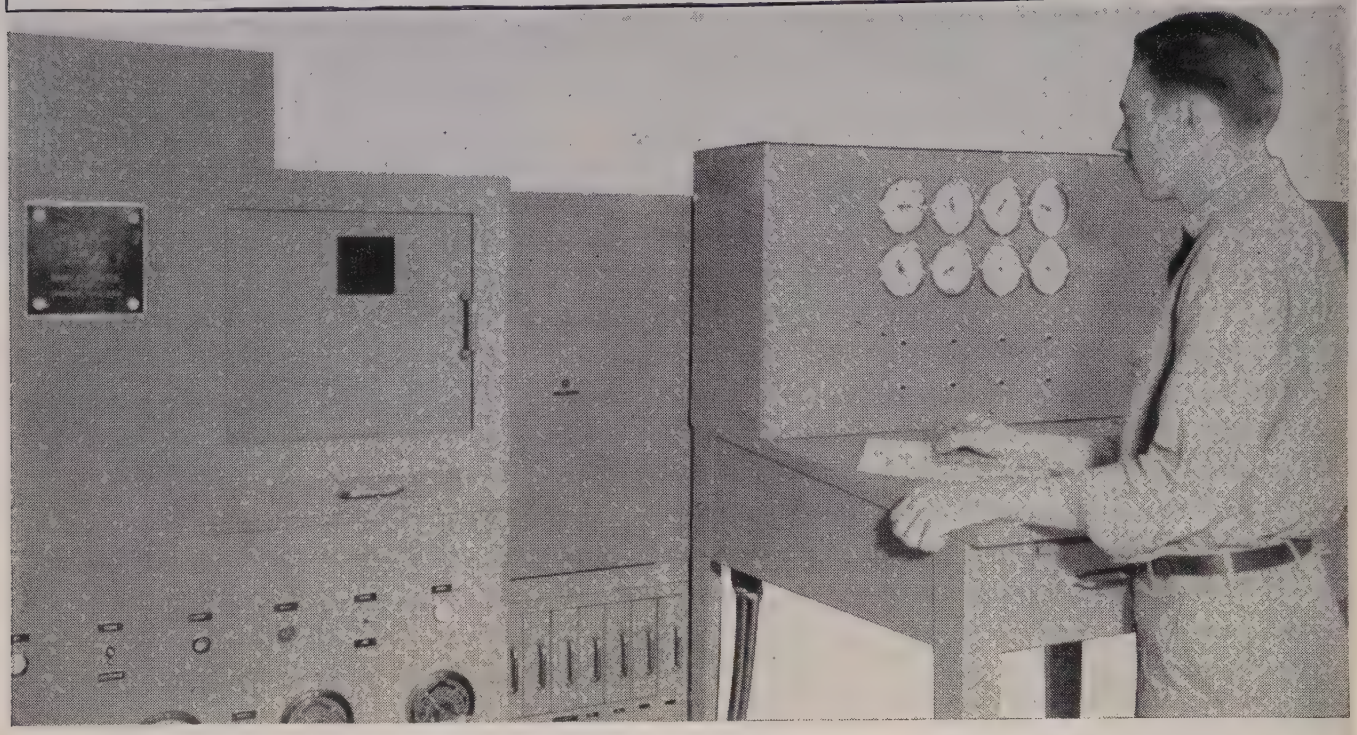
1578 Union Commerce Bldg., Cleveland, Ohio
528 Fisher Building, Detroit, Michigan
176 W. Adams Street, Chicago, Illinois
7251 General Motors Bldg., Detroit, Michigan
3104 Smith Tower, Seattle, Washington
P. O. Box 1633, Tulsa, Oklahoma
325 W. 17th Street, Los Angeles 15, Calif.
Monadnock Building, San Francisco 5, Calif.
1140 Lockwood Drive, Houston 20, Texas
803 Loew Building, Syracuse, New York

Rigidly controlled chemistry



Another reason why you get uniform, high-quality forgings with TIMKEN® forging steels!

YOU can be sure of uniform forgings when you use Timken® forging steels. That's because the quality of Timken forging steels is rigidly controlled, from melt shop all the way through final inspection, by the most precise methods known.

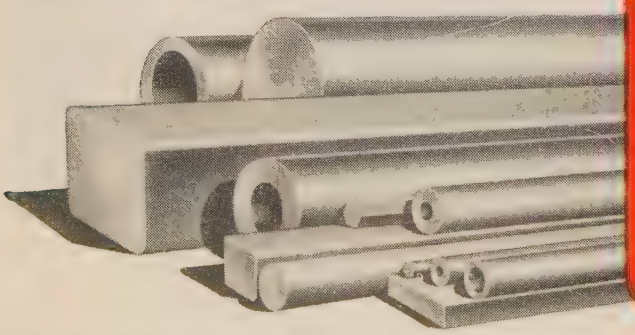
For example, the direct-reading spectrometer shown above chemically analyzes a molten heat of Timken forging steel in just 40 seconds. And a complete analysis report is given to the melt shop within 10 minutes! First of its kind in the steel industry, it's just one of the many ways the Timken Company controls quality at every step in production.

Your order for Timken forging steels is handled individually in our mills. We target conditioning procedure to your particular forging requirements. You can hold rejects to a minimum. And you save steel because the good dimensional tolerances of Timken steel forging bars produce uniform weight multiples with a minimum of steel lost in flashings.

You're assured of uniform physical properties, too, when you use Timken forging steels. They respond uniformly to heat treatment—from bar to bar and heat to heat. Fewer furnace adjustments are needed. And Timken forging steels have uniform grain size after heat treatment. Result: forgings made from Timken forging steels have uniformly high ductility and resistance to impact.

For help in improving the quality of your forgings and cutting production costs, write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
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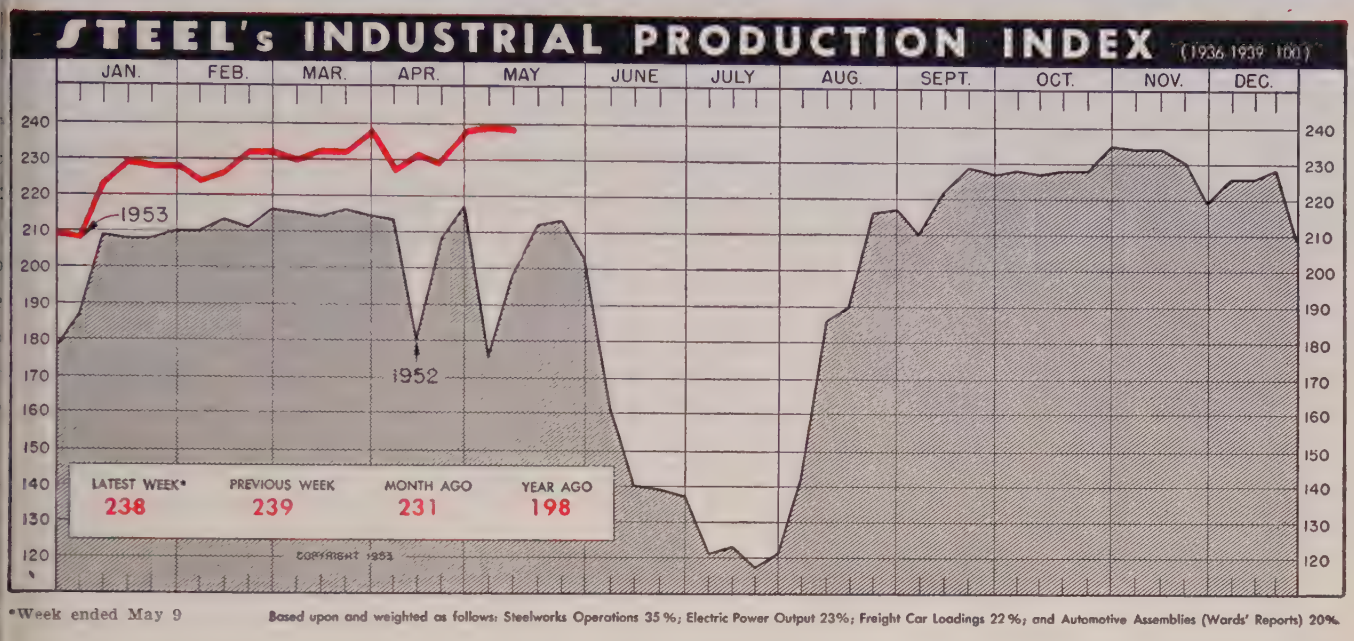
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING


STEEL's INDUSTRIAL PRODUCTION INDEX (1936 1939 100)
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
240 230 220 210 200 190 180 170 160 150 140 130 120
1953
1952
LATEST WEEK* 238
PREVIOUS WEEK 239
MONTH AGO 231
YEAR AGO 198
COPYRIGHT 1953

*Week ended May 9

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%.

Industrial activity in the coming weeks may remain near today's high level. Only minor adjustments to demand are indicated by scattered cutbacks in consumer durables

THE UPSWING in business activity may be just about over. Few declines, however, are shaping up for either defense or consumer production during the coming weeks. Best bet: Industrial output will remain near today's high level.

The start of a sidewise movement in industrial activity may be indicated above in STEEL's production index. The red line on the index—after advancing 1 point in the previous week—edged back down 1 point in the week ended May 9 to 238 per cent of the 1936-1939 average.

Indicators—Prime indicators of industrial momentum point to a leveling-off period. Steel production has remained near capacity for the past three weeks, and producers say that new orders for steel are continuing to pour in. Automotive production in May is scheduled to rise slightly above the April level, but, chances are, actual operations this month will total about the same as last month's turnout. Freight car loadings are moving slowly upward, while electricity production is taking its seasonal decline.

Further indication that the upswing may be over may be the production cutbacks of several makers of consumer durables. General Electric Co. is placing on a three-day workweek its television products plant at Clyde, N. Y. Two large producers of refrigerators and freezers—Crosley Division of Avco Mfg. Co. and Kelvinator Division of Nash-Kelvinator Corp.—are also trimming output.

Downtrend? — These cutbacks, however, don't necessarily indicate a downtrend in consumer goods. But they do show that consumer durables output has finally caught up with demand. Scattered cutbacks will probably continue to arise in the next few weeks, but these may represent only minor adjustments to demand.

Diverse Trends in Autos . . .

Diverse trends in automotive operations may occur in May. Producers of passenger cars are hoping to boost output about 5 per cent over April, while truck production may slip as much as 12 per cent this month.

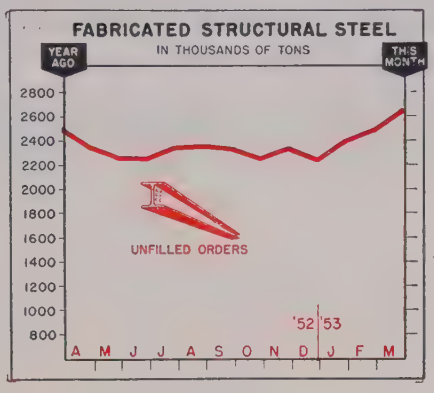
U. S. plants are scheduling to complete 632,500 passenger cars in May, compared with 601,175 actual completions in April, says *Ward's Automotive Reports*. But car volume in early May fell below weekly goals, and only increased activity will enable producers to top the April output.

Domestic truck production is now scheduled at 121,000 vehicles for May, but current strikes in suppliers' plants may hold volume below 115,000 units. U. S. producers in April rolled out 128,506 trucks. Yet a decline in truck operations isn't expected to inflict any great sales damage. Stocks of new trucks on Apr. 1 had climbed to a two-year high for light vehicles and supplies of medium and heavy units were considered by the industry as "comfortable." The truck market, says *Ward's*, is reminiscent of this time in 1952 when output overshot demand.

Combined U. S. and Canadian output in the week ended May 9 totaled 182,123 passenger cars and trucks, down slightly from the 184,800-unit production of a week earlier but 38 per cent over the 130,537 cars and trucks assembled in the week ended May 10, 1952.

Steel Output Hefty . . .

Steel production is remaining at high levels as producers strain to fill customers' orders. The American Iron & Steel Institute estimates that furnaces in the week ended May 16 poured 2,266,000 net tons of steel for ingots and castings. This

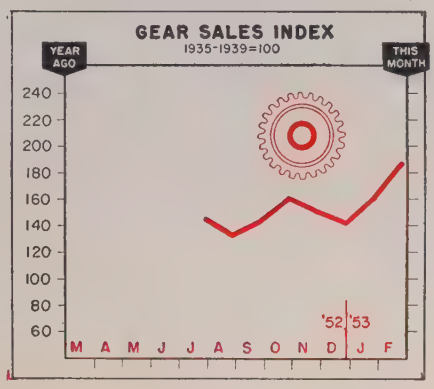


Fabricated Structural Steel

Thousands of Net Tons

	Shipments 1953	Shipments 1952	Backlogs 1953	Backlogs 1952
Jan.	241.4	244.9	2,180	2,416
Feb.	251.1	246.4	2,128	2,408
Mar.	266.3	268.8	2,155	2,501
Apr.	....	230.7	....	2,350
May	....	244.2	....	2,263
June	....	125.5	....	2,261
July	....	138.3	....	2,361
Aug.	....	226.3	....	2,363
Sept.	....	227.6	....	2,342
Oct.	....	261.7	....	2,266
Nov.	....	222.6	....	2,357
Dec.	....	225.2	....	2,153
Total	....	2,664.3		

American Institute of Steel Construction



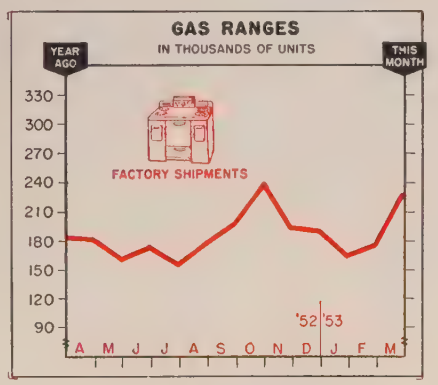
Gear Sales Index

(1947-1949=100)

	1953	1952	1951
Jan.	161.4	670.6*	764.6*
Feb.	188.1	539.5*	809.1*
Mar.	158.9	517.1*	830.7*
Apr.	....	478.7*	742.5*
May	....	425.9*	667.1*
June	....	452.3*	800.9*
July	....	145.3	589.1*
Aug.	....	132.3	564.2*
Sept.	....	143.4	630.0*
Oct.	....	160.8	703.4*
Nov.	....	150.9	530.0*
Dec.	....	140.9	716.5*

*(1935-1939=100)

American Gear Mfrs. Assn.

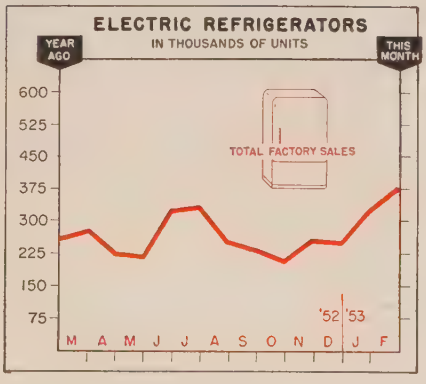


Gas Ranges

Shipments in Units

	1953	1952	1951
Jan.	169,200	166,100	260,600
Feb.	178,300	166,200	254,000
Mar.	229,600	185,200	289,800
Apr.	.....	182,300	225,000
May	.....	162,800	177,800
June	.....	175,700	128,500
July	.....	154,200	116,400
Aug.	.....	178,600	168,100
Sept.	.....	199,600	183,600
Oct.	.....	239,700	210,900
Nov.	.....	186,400	192,200
Dec.	.....	178,600	149,500
Total	.....	2,175,400	2,356,400

Gas Appliance Mfrs. Assn.



Electric Refrigerators

Total Factory Sales—Units

	1953	1952	1951
Jan.	325,186	260,259	465,903
Feb.	377,605	259,838	403,035
Mar.	.....	276,972	558,503
Apr.	.....	225,994	409,887
May	.....	217,017	309,722
June	.....	324,885	261,298
July	.....	333,877	163,922
Aug.	.....	250,224	165,309
Sept.	.....	230,111	193,929
Oct.	.....	207,065	191,519
Nov.	.....	256,530	147,394
Dec.	.....	248,506	195,403
Total	.....	3,091,434	3,465,824

National Electrical Mfrs. Assn.

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Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....Apr. 6	Ranges, Elec. .....Apr. 13	Machine Tools ....Apr. 27
Durable Goods ....May 4	Steel Castings ....Apr. 20	Malleable Castings..Apr. 20
Employ., Metalwk..May 4	Steel Forgings ....Apr. 20	Pumps .....Apr. 6
Employ., Steel ....Apr. 6	Steel Shipments ...May 4	Prices, Consumer ..May 4
Foundry Equip. ...Apr. 27	Wages, Metalwk. ..Apr. 27	Prices, Wholesale..Apr. 13
Freight Cars .....May 11	Gray Iron Castings..Apr. 20	Vacuum Cleaners ..May 11
Furnaces, Indus. ..Apr. 6	Indus. Production..Apr. 27	Washers .....May 11
Radio, TV .....Apr. 13	Ironers .....Apr. 13	Water Heaters .....May 11

estimated turnout is 7000 tons over the previous week and 4000 tons over steelmaking operations in the week ended May 2.

More Spark in Electricty . . .

Watch the year-to-year advances in electricity production. The growth of electric power, particularly in the industrial sections, is a good tip-off on the momentum of industrial operations. Actual output of electricity is declining as warm weather and longer days arrive, but the over-the-year jumps are impressive.

Edison Electric Institute says the net amount of electrical energy distributed by the U. S. utility industry is about 14 per cent over that of a year ago. Last fall, the annual increase was somewhere around 7 per cent. Special note: Electricity production in the central industrial section of the U. S. is now about 19 per cent over a year ago.

Bank Clearings Increase . . .

A good yardstick of industrial velocity is the amount of dollar-turnover of the nation's banking institutions. Bank clearings in the week ended May 6 amounted to $2.9 billion in the 25 leading cities of the U. S., or an increase of 5.9 per cent over the comparable week in May, 1952, says Dun & Bradstreet Inc. Reflecting in part the step-up in automotive operations, clearings of Detroit banks that week rose 19.1 per cent over the week ended May 6, 1953.

Construction Awards Jump . . .

The construction boom, moving through April, seemed well on the way to a 1953 total exceeding the all-time high of 1952.

Contract awards for construction in the 37 states east of the Rockies rose 9 per cent above a year earlier to $1.7 billion in April, says F. W. Dodge Corp. Nonresidential awards rose 21 per cent over April, 1952, to $680.3 million, while residential contracts slipped 1 per cent to $673.9 million. Heavy engineering and public works and utilities totals increased 10 per cent over the year to $387.3 million in April.

In the first four months of 1953 construction awards in the 37 eastern states totaled $5.2 billion, or

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	100.0	100.5	83.0
Electric Power Distributed (million kwhr)	7,897	7,939	7,039
Bituminous Coal Output (daily av.—1000 tons)	1,458	1,508	1,425
Petroleum Production (daily av.—1000 bbl)	6,270[1]	6,276	N.a.[8]
Construction Volume (ENR—millions)	$252.6	$373.1	$315.1
Automobile, Truck Output (Ward's—units)	182,123	184,800	130,537
TRADE			
Freight Car Loadings (unit—1000 cars)	790	781	720
Business Failures (Dun & Bradstreet, number)	165	169	161
Currency in Circulation (millions)[3]	$29,863	$29,787	$28,523
Dept. Store Sales (changes from year ago)[3]	+2%	−1%	+6%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,372	$17,292	$17,345
Federal Gross Debt (billions)	$265.6	$264.5	$258.4
Bond Volume, NYSE (millions)	$14.0	$17.2	$13.8
Stocks Sales, NYSE (thousands of shares)	6,254	6,376	5,598
Loans and Investments (billions)[4]	$76.3	$76.4	$73.3
United States Gov't. Obligations Held (billions)[4]	$29.2	$29.4	$31.5
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	221.1	221.1	238.0
All Commodities[7]	110.0	110.0	112.3
All Commodities Other Than Farm and Foods[7]	113.3	113.3	113.8

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1953, 2,254,459; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100. [8]Not available.

10 per cent above January-April, 1952. All categories showed gains for the four months: Nonresidential, $1.9 billion, up 13 per cent; residential, $2.2 billion, up 7 per cent; heavy engineering, $1.1 billion, up 10 per cent—as compared with the first four months of 1952. For the 1953 construction outlook, see STEEL, May 11, p. 75.

Personal Income Rising . . .

Metalworking companies producing consumer goods may take encouragement from the increase in personal income. At present, customers have about 7 per cent more dollars than at this time last year. The Commerce department's Office of Business Economics says that personal income in the first quarter rose to an annual rate of $281.3 billion, or 7 per cent above 1952's first quarter. Nonagricultural income rose to a $261.0 billion annual rate from $242.6 billion, while agricultural income declined $100 million over the year to an annual rate of $20.3 billion in the first quarter.

Retail Volume Slips . . .

Take careful note of holidays if you watch retail volume for trends in consumer demand. An example is the over-the-year decline of department store volume in May. The Federal Reserve Board says that department store sales in the four weeks ended May 2 declined 2 per cent under the comparable weeks of 1952. But no actual downtrend is in view. The hitch? Customers in April, 1952, had another week for Easter shopping.

Trends Fore and Aft . . .

Freight car loadings are about 5 per cent over a year ago when brief steel strikes occurred but are 3 per cent under loadings in this same period of 1951. . . More jobs were found for workers by public employment offices in March than in any previous March since World War II. . . Wholesale prices dropped 2 per cent in March and April. . . Leading petroleum companies are estimating that oil demand in 1953 will run 3-5 per cent above 1952 . . . Manufacturers of metal products in 1953 have borrowed $321 million more than they repaid. . . Estimated net income of Class One railroads amounted to $72 million in March, compared with $52 million in the same 1952 month. . . Industries in the Detroit area added 10,000 women to the payrolls in the month prior to March 15 as unemployment continues at a record low. At auto plants, quits average 46 per thousand workers, higest since September, 1950.

Quality Controlled
PHEOLL
SCREWS, BOLTS, NUTS and SPECIAL FASTENERS

...SPEED ASSEMBLIES • IMPROVE YOUR PRODUCT...

SAVE STOCKROOM TIME

Requisitions to your stockroom for Pheoll Fasteners can be filled in less time. Boxes, kegs and packages are plainly marked with sizes clearly indicated for rapid identification. Pheoll's quality products handle easily, can be quickly counted or transferred to bins or assembly line trucks.

REDUCE ASSEMBLY TIME

Workmen gain time assembling with Pheoll screws, bolts, and nuts because they are accurately threaded, drive easily, seat rapidly, grip tighter—assuring stronger assemblies, easier inspection and less rejects.

IMPROVE YOUR PRODUCT APPEARANCE

The uniform quality of Pheoll Fasteners improves your product appearance. Precision slotted and finished heads, cleanly chamfered nuts, prevent marred surfaces and add to your product's sales appeal. Write for Pheoll literature and price list.

Save Costs...Increase Profits with these Pheoll Fasteners

ASK ABOUT PHEOLL Machine Screws† Machine Bolts • Special Screws and Bolts Cap Screws • Machine Screw Nuts • Wood Screws† • Thumb Screws • Brass Washers Stove Bolts†

†Furnished in slotted and Phillips Recessed Head Types

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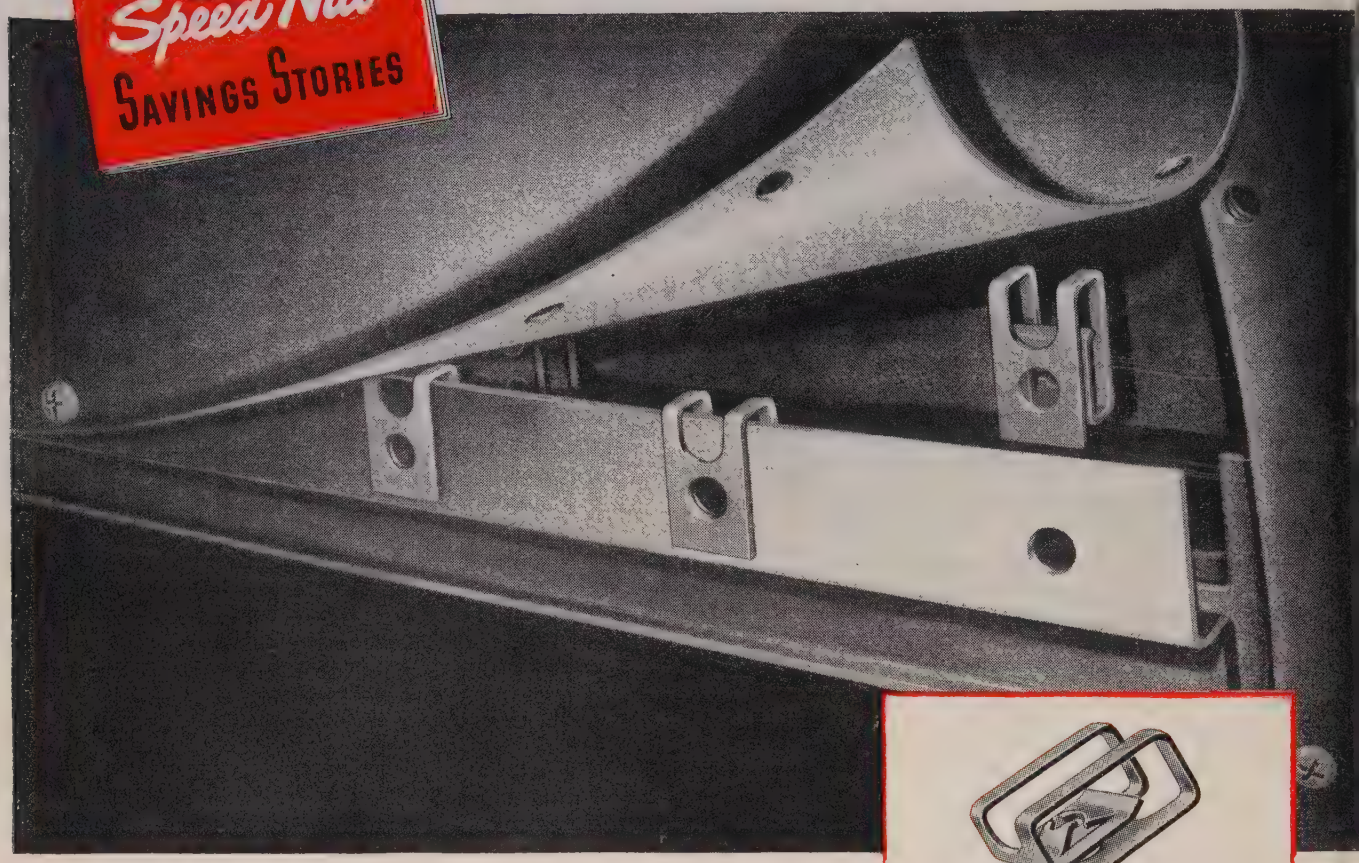
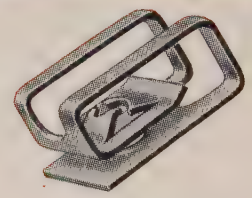
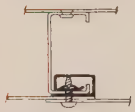
Speed Nut®

SAVINGS STORIES

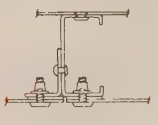




U-TYPE SPEED NUTS



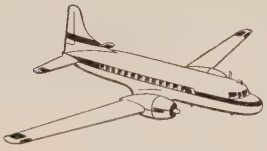
SPEED NUT WAY:
A U-Type SPEED NUT and a No. 10 sheet metal screw are all it takes per hole application.



OLD WAY:
Required: 2 each, Plate Nuts, Screws, Washers; 4 rivets; 1 angle trim; 1 doubler strip, per hole application.

Comparing the above methods it's easy to see how the 450 hole applications required per airplane amount to tremendous savings.

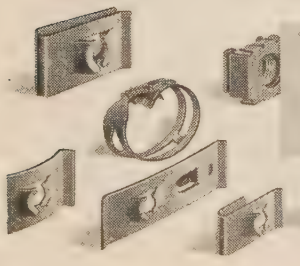
CONVAIR saves 448 man hours per plane...on one SPEED NUT fastening operation!



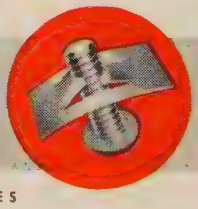
Tremendous savings like these by Consolidated Vultee Aircraft Corporation's San Diego Division may be hard to imagine, but...they can be made! Convair Engineering and Production experts are making this amazing economy on *one* SPEED NUT fastening operation... the installation of cargo liners in the new Convair 340 passenger transport! Also, the same operation yielded a sensational 80% reduction in production time, plus a 40% cut in materials and handling. Completing the story... the use of this U-Type SPEED NUT has eliminated an entire assembly section, releasing several trained aircraft workers to other production jobs!

Considered in terms of industry-wide aircraft production... savings and production boosts like these can mean millions of dollars. For similar solutions to fastening problems you may have, see the Tinnerman representative in your area!

Send today for your copy of SPEED NUT "Savings Stories"; write: TINNERMAN PRODUCTS, INC., Dept. 12, Box 6688, Cleveland 1, Ohio. *In Canada:* Dominion Fasteners Ltd., Hamilton, Ontario. *In Great Britain:* Simmonds Aerocessories, Ltd., Treforest, Wales. *In France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine).



TINNERMAN Speed Nuts®



MORE THAN 8000 SHAPES AND SIZES

Men of Industry

JOHN D. WILLIAMS
. . . Rollway Bearing v. p.-gen. mgr.

John D. Williams was elected vice president and general manager, **Rollway Bearing Co. Inc.**, Syracuse, N. Y. He succeeds **William B. Smithers**, resigned. Mr. Williams holds the same positions with Lipe-Rollway Corp.

Norman F. Melville was made general manager of sales, **Sunbury Wire Rope Co.**, Sunbury, Pa. Since November, 1950, he has served as chief of the wire section, Iron & Steel Division, National Production Authority. Previous to that he was with Pittsburgh Steel Co. as manager of sales, steel and wire products.

Tennessee Coal & Iron Division, U. S. Steel Corp., has formed a tin mill products division of the sales department. **J. E. Hill**, superintendent of the Fairfield, Ala., tin mill, was appointed to head the new sales activity as manager of sales, tin mill products division. He is succeeded by **Roman J. Meyer**, who in turn in succeeded as superintendent, Fairfield sheet mill, by **D. A. Haarbauer. M. F. Glascock** becomes assistant superintendent.

P. E. W. Goodwin Jr., manager of outside manufacturing facilities for **Rockwell Mfg. Co.**, was named manager of a new Rockwell meter and valve plant scheduled to open next fall in Sulphur Springs, Tex.

FRED C. LAUBENHEIMER
. . . Follansbee div. sales mgr.

Follansbee Steel Corp. appointed **Fred C. Laubenheimer** sales manager for its sheet metal specialty division. He joined the company in 1925, working for 14 years for Follansbee Metal Warehouses. In 1939 he transferred to a position with the division whose sales program he now heads. Formerly located in Rochester, N. Y., he now moves to the firm's manufacturing site at Follansbee, W. Va.

Fred M. Gillies was promoted to president of **Acme Steel Co.**, Chicago. He is replaced as executive vice president by **Guy T. Avery**, formerly vice president-production. **Chester M. MacChesney** was named chairman of the executive committee. He is succeeded as chairman of the board by **Carl J. Sharp**, formerly president.

Robert D. Sheehan was appointed director of material control and purchasing for **Buick-Oldsmobile-Pontiac Assembly Division**, General Motors Corp., Detroit. He succeeds **Frank H. Burns**, transferred to the **Fisher Body Division** as assistant manager, material handling and control section.

National Twist Drill & Tool Co., Rochester, Mich., elected **A. R. Devine** secretary, **J. W. Davidson** treasurer, and **A. L. Norton** comptroller.

DEWEY BOOKOUT
. . . Perfect Circle chief indus. engr.

At **Perfect Circle Corp.**, Hagerstown, Ind., **Dewey Bookout** was appointed to the newly created position of chief industrial engineer. He was manager of the manufacturing division, which now has been split into two parts with **Richard Bancroft** heading the castings division and **Dean Parsons** the machining division. **Karl Effman** now heads the engineering division, a position formerly held by Mr. Bancroft.

Paul A. Roush, senior project engineer at **Flexible Tubing Corp.**, Guilford, Conn., was named manager, product development. He is in charge of research, product development and quality control activities.

Ernest R. Johnson succeeds **E. A. Schwartz**, resigned, as assistant vice president-operations, **Republic Steel Corp.**, Cleveland. Mr. Johnson was manager of the central alloy district, Massillon, O., where he is replaced by **Oscar A. Bamberger** and **Joseph H. Jones** becomes assistant district manager. The latter is succeeded as superintendent of the Massillon steel plant by **Robert P. Carpenter**, formerly superintendent, open-hearth department, Cleveland.

York Engineering & Construction Co. and **York-Gillespie Mfg. Co.**, Pittsburgh, appointed **Thomas E.**

Breyley Midwest manager of engineering and equipment sales.

Pittsburgh Gage & Supply Co., Pittsburgh, appointed **James R. McCutcheon Jr.** manager of its piping supplies department.

The following are officers of **Willys Motors Inc.**, Toledo, O., formed last week through purchase of Willys-Overland Motors Inc. by Kaiser Mfg. Corp. **Edgar F. Kaiser**, president of Kaiser-Frazer Corp., who has been president of its subsidiary, Kaiser Mfg. Corp., now named Willys Motors Inc., will continue as president and a director of the new firm. **Raymond R. Rausch**, who was vice president and executive assistant to the president of Willys-Overland Motors, was named executive vice president and a director of the new company.

Enthone Inc., New Haven, Conn., appointed **Hubert M. Goldman** to the newly created post of assistant to the sales manager and technical engineer, and **Francis A. Schneiders** as technical service manager. **L. J. Durney Jr.** and **E. F. Foley** were appointed research chemists.

James Haig joined **Soule Steel Co.**, San Francisco, as personnel manager. He held a similar post at American Can Co.'s San Jose, Calif., plant.

Kenneth E. Palmer was named district sales manager in the Detroit office of **Peninsular Grinding Wheel Sales Corp.**

J. A. Wilson Jr. was made assistant chief engineer, **C. A. Norgren Co.**, Englewood, Colo.

Jack & Heintz Inc., Cleveland, appointed **Frank A. Haag** to the new position of sales manager—commercial products, and **Lawrence L. Bechler** manager of commercial motor sales replacing **R. W. James. S. Floyd Stewart** assumes a newly created position of assistant to the president, with a major portion of his activities devoted to new product planning.

Erickson Tool Co. has opened a Mid-Atlantic division office. **Robert F. Lotz** was appointed manager of this new office, which is in the Philadelphia area, at 32 Rittenhouse Place, Ardmore, Pa.

J. A. HAGUE

E. C. VAN SYCKLE

. . . appointments at Pittsburgh Steel Co.

J. A. Hague was made assistant general manager of sales for **Pittsburgh Steel Co.**, Pittsburgh, and **E. C. Van Syckle** was made manager, rod and manufacturers wire sales. **B. R. Hagelbarger** replaces Mr. Hague as Cleveland district sales manager where **W. E. Shutt** becomes assistant district sales manager. In his new position, Mr. Hague is responsible for sale of wire rods, manufacturers wire, merchant trade wire products and chain link fence.

Doerr Electric Corp., Cedarburg, Wis., appointed **Karl A. Blind** assistant to the president. He previously was chief engineer of Dings Magnetic Separator Co. **Carl F. Kowal**, previously with Louis Allis Co., was appointed assistant sales manager and **William F. Boerger** was named service manager. Mr. Boerger was with Delta Division, Rockwell Mfg. Co.

STANLEY B. LINDH

Made sales promotion manager of Atkins Saw Division, Indianapolis, Borg-Warner Corp.

John T. Davidson, chief engineer, assumes the new post of vice president, **Standard Register Co.**, Dayton, O., in charge of engineering.

International Staple & Machine Co., Herrin, Ill., elected **Philip C. Cooke** executive vice president.

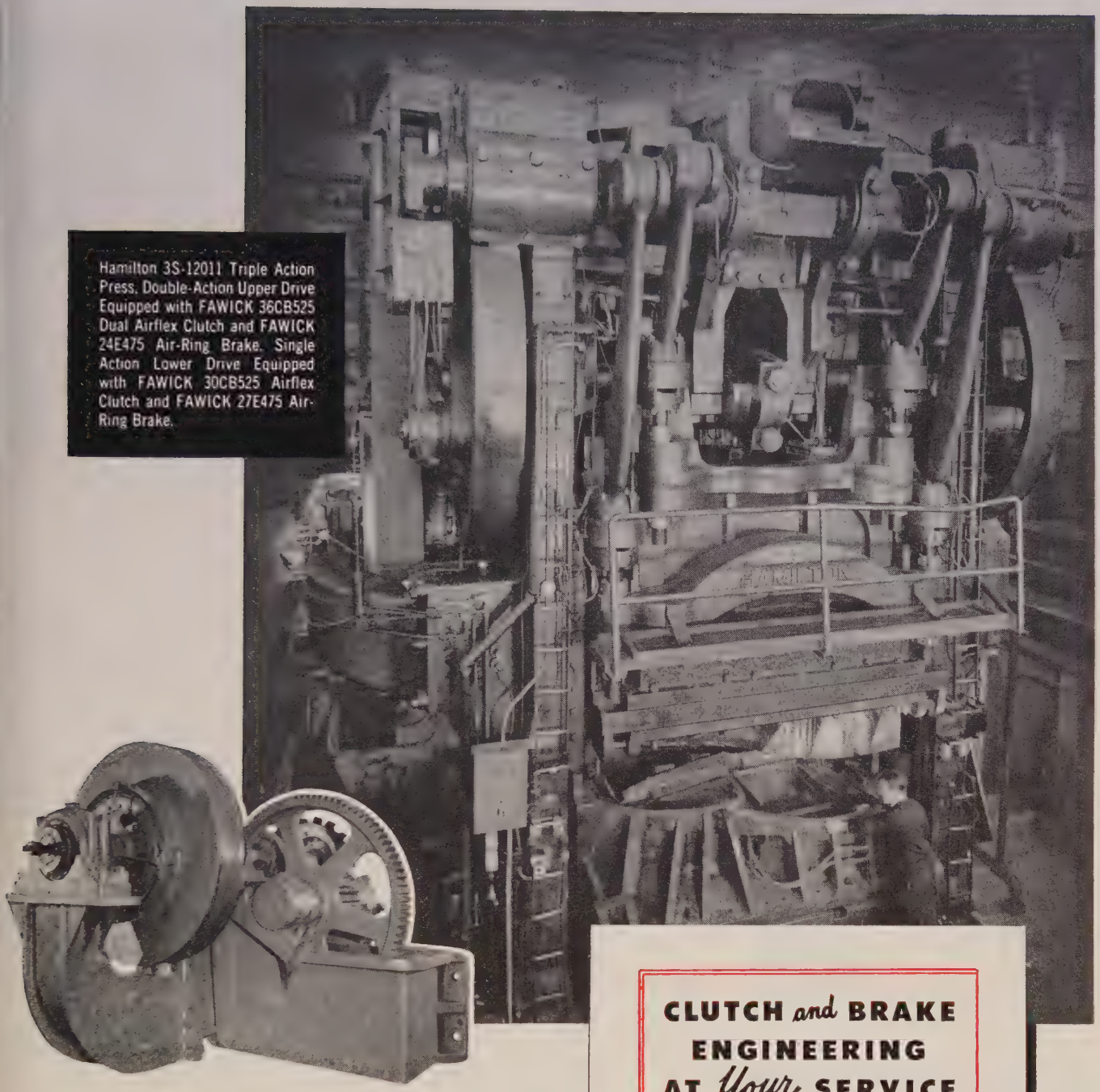
L. Eugene Root heads a newly created department at **Lockheed Aircraft Corp.**, Burbank, Calif. The new unit, development planning department, is composed of a group of scientists and technicians working on long-range civil and military aircraft trends. Mr. Root is director of development planning.

Ralph I. Lewis was made superintendent of maintenance for **Pittsburg Steel Co.'s** Allenport Works, Allenport, Pa.

Hugh H. Trumbull was made New England district sales manager, **Solar Steel Corp.**, Cleveland.

W. J. Jacoby was made controller, **A. R. Purdy Co. Inc.**, Lyndhurst, N. J.

E. A. Mishler was appointed assistant Airtemp sales manager, export division, **Chrysler Corp.**, Detroit. **C. B. Thomas**, who has served as president of the export division



Hamilton 3S-12011 Triple Action Press, Double-Action Upper Drive Equipped with FAWICK 36CB525 Dual Airflex Clutch and FAWICK 24E475 Air-Ring Brake. Single Action Lower Drive Equipped with FAWICK 30CB525 Airflex Clutch and FAWICK 27E475 Air-Ring Brake.

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FAWICK *Airflex*
INDUSTRIAL CLUTCHES AND BRAKES

EARL V. ERICSON
. . . new post at Deepfreeze Appliance

CLIFFORD E. BURT
. . . Chance Vought Aircraft factory mgr.

T. A. STRAUB Jr.
. . . v. p. Fort Pitt Bridge Wks.

since 1942, was elected a director of the corporation. He also serves as a vice president of Chrysler.

Earl V. Ericson was appointed to the newly created post of general production superintendent, **Deepfreeze Appliance Division,** Motor Products Corp., Chicago. Since 1948 he has been production superintendent of the Deepfreeze home freezer plant in North Chicago.

John W. Young was appointed director of quality control and **Fred L. Boeke** chief power plant engineer at **North American Aviation Inc.,** Los Angeles.

Julius Saloway, manager, liquidation division, **Morey Machinery Co. Inc.,** New York, was elected to the directorate of the company.

Clifford E. Burt, assistant factory manager at **Chance Vought Aircraft Division,** United Aircraft Corp., Dallas, was appointed factory manager, manufacturing department. He replaces **Bertram D. Taliaferro,** retired.

William M. Allison is technical adviser, **Sprague Electric Co.,** North Adams, Mass. For the last 20 years he has been a senior executive in the Sprague research and engineering department.

John Schippers was made Chicago area manager, **Service Caster & Truck Corp.**

Paul Winkler was named vice president and director of sales, **Bardwell & McAllister Inc.,** Los Angeles.

T. A. Straub Jr. was elected vice president, **Fort Pitt Bridge Works,** Pittsburgh. A director since 1944, he has served for the last five years as assistant to the president. He also is president of Electric Welding Co, a subsidiary.

Roger H. Debenham was appointed director of industrial relations for **Automatic Transportation Co.,** Chicago.

J. V. McGuire was made sales manager and **George W. O'Keeffe** and **Clinton F. Kucera** assistant sales managers of the recently organized switchgear department, **Allis-Chalmers Mfg. Co.** Mr. McGuire will continue headquarters at the West Allis Works, West Allis, Wis. Mr. O'Keeffe continues at the Boston Work's circuit breaker sales section of which he has been manager since 1943. Mr. Kucera remains at West Allis Works where he was engineer in charge of switchgear sales.

Oliver G. Dumont was named superintendent, electrical departments, at the Norwood, O., Works, **Allis-Chalmers Mfg. Co.,** to succeed **G. C. Vogel,** recently made general superintendent.

New vice presidents of **Westinghouse Electric Corp.,** Pittsburgh, are: **Bruce D. Henderson** in charge of purchases and traffic; **William C. Rowland,** in charge of the manufacturing and repair division; **Franklin L. Snyder,** assigned to the staff of L. E. Osborne, executive vice president, Defense Products Divisions; **C. Swan Weber,** in charge of the Washington office; and **Robin S. Kersh,** in charge of the eastern district. **Leslie E. Lynde** becomes manager, aviation gas turbine division, succeeding Mr. Snyder, who remains temporarily at the division's headquarters in Philadelphia.

Robert W. Lea, former president of Johns-Manville Corp., and presently a director of **Olin Industries Inc.,** East Alton, Ill., was elected to Olin's executive committee.

John E. Manning was appointed western district manager, Promat Division, **Poor & Co.,** Waukegan, Ill.

Sharon Steel Corp. appointed **Paul I. Davis** Cincinnati district sales manager to replace the late **Lawrence Broderick.**

Retiring from executive posts at **Chrysler Corp.,** Detroit are: **Herman L. Weckler,** vice president and general manager; **David A. Wallace,** president, and **Joseph A. O'Malley,** vice president and general sales manager, Chrysler Division.

H. L. Goodenough was elected comptroller, **American Smelting & Refining Co.,** New York, succeeding **E. C. Corson,** retired. **Dr. Albert J. Phillips,** director of the research department, was elected vice president.

C. P. Rooney was elected treasurer of **Mine Safety Appliances Co.,**

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HOLL-O-CAST ROLLS • CHILLED IRON ROLLS • DENSO
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LIMA, OHIO • Plants at Lima and Springfield, Ohio

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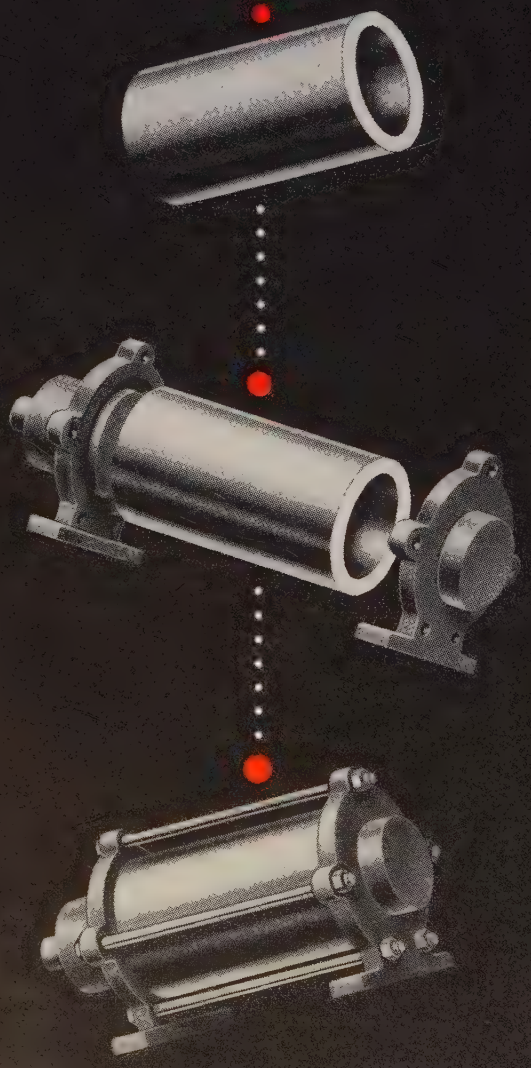

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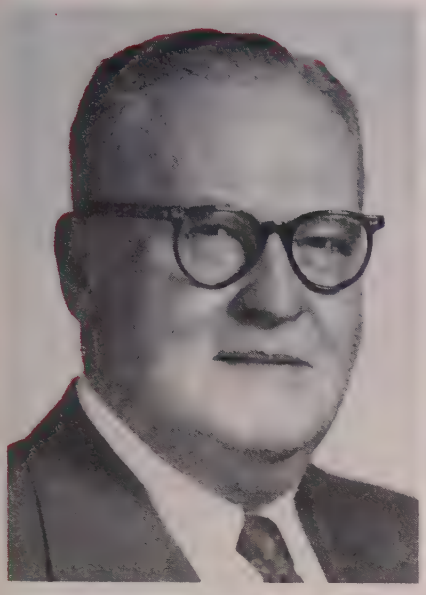

E. K. MILLER

JOHN E. TIMBERLAKE

HERBERT JOHNSON

. . . new vice presidents of Jones & Laughlin Steel Corp.

Pittsburgh. He became assistant secretary in 1940 and assistant treasurer in 1948.

George Bennett was elected executive vice president and general manager, **Harold F. Howard Co.**, Detroit.

C. S. Davis Jr., president-general manager, Norge Heat Division, **Borg-Warner Corp.** at Kalamazoo, Mich., was elected a director of the corporation.

Thomas A. Robertson, secretary, was elected a vice president, **Mosler Lock Co.**, Covington, Ky., subsidiary, Mosler Safe Co.

John A. Couch was appointed general agent in the sales department of **Geo. F. Alger Co.**, Detroit.

H. Roger Coleman was appointed development director, **R. S. Aries & Associates**, New York. Recently with Evans Chemetics Inc., he formerly was sales manager, special products division, General Aniline & Film Corp.

David A. Griffith, for the last year assistant manager of **Allis-Chalmers Mfg. Co.'s** Washington office, was recalled to the Pittsburgh Works as assistant general manager.

Cyril M. Ondrey was made traffic manager, **United States Steel Corp.**, in Chicago.

New vice presidents at **Jones & Laughlin Steel Corp.**, Pittsburgh, include **E. K. Miller**, in charge of production; **John E. Timberlake**, sales; **Herbert Johnson**, administration. **Adam J. Hazlett**, executive vice president-distribution, was elected executive vice president of the corporation. Scheduled to retire June 1 under retirement policy of the corporation, **John B. Mitchell**, executive vice president-production, was named special consultant to the president. He will continue on the board of directors, a member of the executive committee and of the management committee.

Lee Sekulski, sales manager, **Mathews Conveyer Co.**, Ellwood City, Pa., was elected vice president for sales and **Wendell S. Hancher** was elected assistant treasurer.

Raymond S. Doherty was named manager, National Packet sales, in the heating division of **National Radiator Co.**, Johnstown, Pa., and **Sigmond Moroh** as manager, accessories sales.

Martin E. Conroy joined the technical sales staff, chemical manufacturing division, **M. W. Kellogg Co.**, subsidiary of Pullman Inc., New York. **Leo J. FitzHarris**, located at 18 W. Monument Ave., Dayton, O., was assigned to the division's Ohio technical sales.

Donald L. Millham, comptroller, **General Electric Co.**, was appointed general manager, GE Lamp Division, Cleveland. **Gerald L. Phillippe** succeeds Mr. Millham as manager, accounting services division, with headquarters in New York. Mr. Millham assumes duties of **Fred F. Harroff**, vice president - general manager, Lamp Division, who is resigning, but will be retained as a consultant.

Kenneth H. Colville Jr. was elected secretary and a director of **Hendrick Mfg. Co.**, Carbondale, Pa. He has been with the company since 1940.

Pullman-Standard Car Mfg. Co., Chicago, appointed **Warren E. Porter** manager of its commercial engineering and field service section, track equipment department. **Harry Peaker** and **Harry J. Dumich** were named eastern and western service managers, respectively.

David Meeker was promoted from Pacific Coast sales manager to assistant general sales manager in charge of staff operations at **Dearborn Motors Corp.**, Birmingham, Mich. He is succeeded by **F. S. Lockwood Jr.**

At **Link Aviation Inc.**, Binghamton, N. Y., **Robert F. Hall** was made manager of production engineering, **Floyd H. Lawson** manager of inventory control, and **Albert T. Threthaway** manager of production control. **Byron S. Brokaw** was ap-

J. M. HENDRICKSON
. . . Pannier Corp. v. p.

S. LEONARD SCHWARZ
. . . supt. at De Laval's North plant

JACK D. COLYER
. . . Bellevue Industrial Furnace sales mgr.

pointed executive assistant to the president.

Pannier Corp., Pittsburgh, appointed **J. M. Hendrickson** vice president, research and development. He formerly was director of mechanical research at Eljer Co.

H. E. Jensen, chief engineer of **C & D Batteries Inc.**, Conshohocken, Pa., was elected vice president-engineering. **Stewart E. Doughty**, quality control supervisor, was elected to the board of directors.

International Machinery Division, British Industries Corp., New York, appointed **John C. Steere** district sales manager for Rhode Island. **Richard Fraser** was made Pittsburgh district manager.

James H. Flagg was elected executive vice president, **Mercer Tube & Mfg. Co., Sawhill Mfg. Co.** and **Shenango Agaloy Tube Co.**, Sharon, Pa.

S. Leonard Schwarz was promoted to superintendent of **De Laval Steam Turbine Co.'s** North plant, Trenton, N. J., where since 1951 he has been assistant superintendent of shop operations.

William J. Bird was appointed general sales manager of **Chrysler Corp.'s** Plymouth Division to succeed **R. C. Somerville**, now vice president of the Dodge Division.

George L. Irvine was elected a commercial vice president, **General Electric Co.**, with headquarters in Dallas. He succeeds **William B. Clayton**, retiring after almost 48 years of service.

Jack C. Limozaine was made superintendent of the newly established material planning and control division, **Engineering & Research Corp.**, Riverdale, Md.

Earl S. Mollard was made general manager of **M. A. Hanna Co.'s** mining and smelter operations in Oregon.

Jack D. Colyer was made sales manager of **Bellevue Industrial Furnace Co.**, Detroit. He has been associated in executive positions with various industries in Detroit for the last 25 years and most recently has been acting as a sales consultant.

James C. Hicks was made director of refractory research, **Kaiser Aluminum & Chemical Corp.**, Oakland, Calif., to succeed the late **L. W. Austin.**

Jack C. Dilling was appointed manager, Indianapolis sales office, **Berger Mfg. Division**, Republic Steel Corp. He succeeds **Robert N. Griffith**, appointed manager, shelving sales department, at Berger's headquarters in Canton, O.

Hydropress Inc., New York, appointed **Theodor Wutscher** chief designer, rolling mill division.

Jerold L. Welch was appointed assistant chief engineer, **Reed-Prentice Corp.**, Worcester, Mass.

OBITUARIES...

W. Edgar Spear, 60, chairman of **Chiksan Co.**, Brea, Calif., died May 4.

R. A. Mitchell, 66, vice president and director, **Pittsburgh Forgings Co.**, Coraopolis, Pa., died recently.

R. H. Baker, 67, eastern sales manager, **Kensington Steel Co.**, Chicago, died May 2.

Louis H. Burmeister, 76, president, **L. Burmeister Co.**, Milwaukee, died Apr. 30.

Charles Lindmueller, 79, general manager, **Metal & Thermit Corp.**, East Chicago, Ind., died May 3. He had been with the firm 42 years.

J. Beach Clow, 49, vice president, **James B. Clow & Sons**, Chicago, died May 5.

Clarence E. Abbott, former vice president, **Tennessee Coal, Iron & Railroad Division**, U. S. Steel Corp., died recently in Raleigh, N. C.

Eric L. Olsen, 53, vice president, **Onsrud Cutter Mfg. Co.**, Libertyville, Ill., died May 3.

Lambert N. Slater, 64, vice president of the central California and Arizona districts of **Consolidated Western Steel Division**, U. S. Steel Corp., died Apr. 26 in Los Angeles.

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Ryerson Expands in West

Reinforcing bar fabricating operations will be added to services offered at Spokane plant

STEEL service facilities at the Spokane, Wash., plant of Joseph T. Ryerson & Son Inc., Chicago are being expanded. The company bought this plant from Inland Empire Steel Co. in 1951.

Work has begun on a new span which will permit the addition of reinforcing bar fabricating operations to the company's service on other types of steel. About 10,000 sq ft of working space will be made available for this purpose. R. M. Bialkowsky, former manager of Inland Empire Steel, is Ryerson plant manager at Spokane. A. P. Flagg is manager of the new reinforcing products department at the plant.

Central Iron Builds Pipe Mill

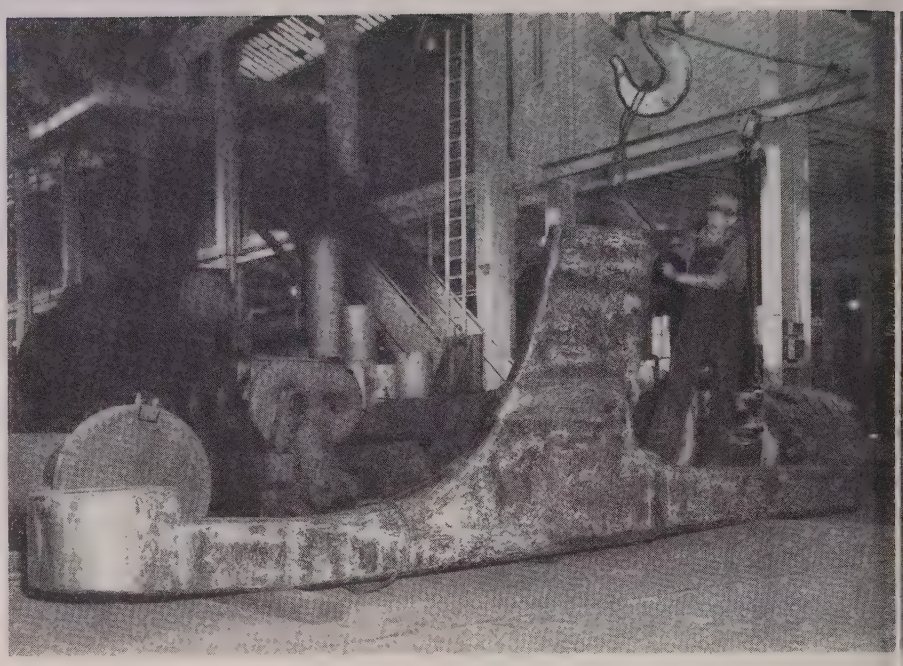
The pipe mill planned by Central Iron & Steel Co. in Harrisburg, Pa., may be operating by late summer. According to construction plans announced by the company, a steel plant 400 by 180 ft will be erected which will produce high pressure gas transmission pipe. Cost is estimated at $1,750,000, including plant, machinery and railroad sidings.

Magnesium Plant Closing

Officers of Pacific Northwest Alloys Inc., Spokane, Wash., are taking steps to close the $20 million government-owned electric metallurgical magnesium plant at Mead, Wash. This is in line with official orders received from the Munitions Board. The plant was leased from the government in 1948 to produce ferroalloys which have been going into the government stockpile.

Ducommun Metals Expanding

A development program involving expansion of facilities, services and markets is under way at Ducommun Metals & Supply Co., Los Angeles. The program will include installation of additional machinery and equipment at a cost of $200,000, says Charles Ducommun, president.



Shipyard Workers "Sculpture" 20-Ton Steel Block

Virtually formed by hand, this stern frame section and skeg was forged and flame cut at Bethlehem Pacific Steel Corp.'s San Francisco shipyard in three weeks for the Navy. The gross outline was first flame cut from the forging by machine, then flame gouged by hand to the finished shape. The upper 3 ft of the stern frame was joined to the skeg by thermit welding. "Sculpturing" was done from a 20-ton block of steel measuring 30 in. by 30 in. by 17 ft

Feldspar Mine Changes Hands

Out of a hilltop in Alstead, N.H., comes feldspar, essential raw material in the making of pottery, glass, enamelware and scouring powders. Largest producer of the mineral in the United States, the mine works the deposits in pits and tunnels 200 ft deep. Much of the output goes to Westinghouse Electric Corp. and General Electric Co. for use in electric insulators. Operated since 1939, the mine has been taken over by G. G. Copeland of New Canaan, Conn., and Canadian interests.

Machinery Firm To Open Plant

Lynn Mechanical Development Co., Compton, Calif., will start manufacture of special automatic machinery and automatic machine tooling in June. Forrest E. Wood is general manager.

Offers To Buy Drayer-Hanson

United States Radiator Corp., Detroit, proposes purchase of stock of Drayer-Hanson Inc., Los Angeles. If the plan is approved by the proper authorities, United States Radiator would operate Drayer-Hanson as a subsidiary with no change in its present personnel. Drayer-Hanson manufactures air conditioning equipment, commercial refrigeration units, water chillers, product coolers, finned steel and copper tubing, oil refinery equipment and aircraft components.

Cincinnati Machinery Moves

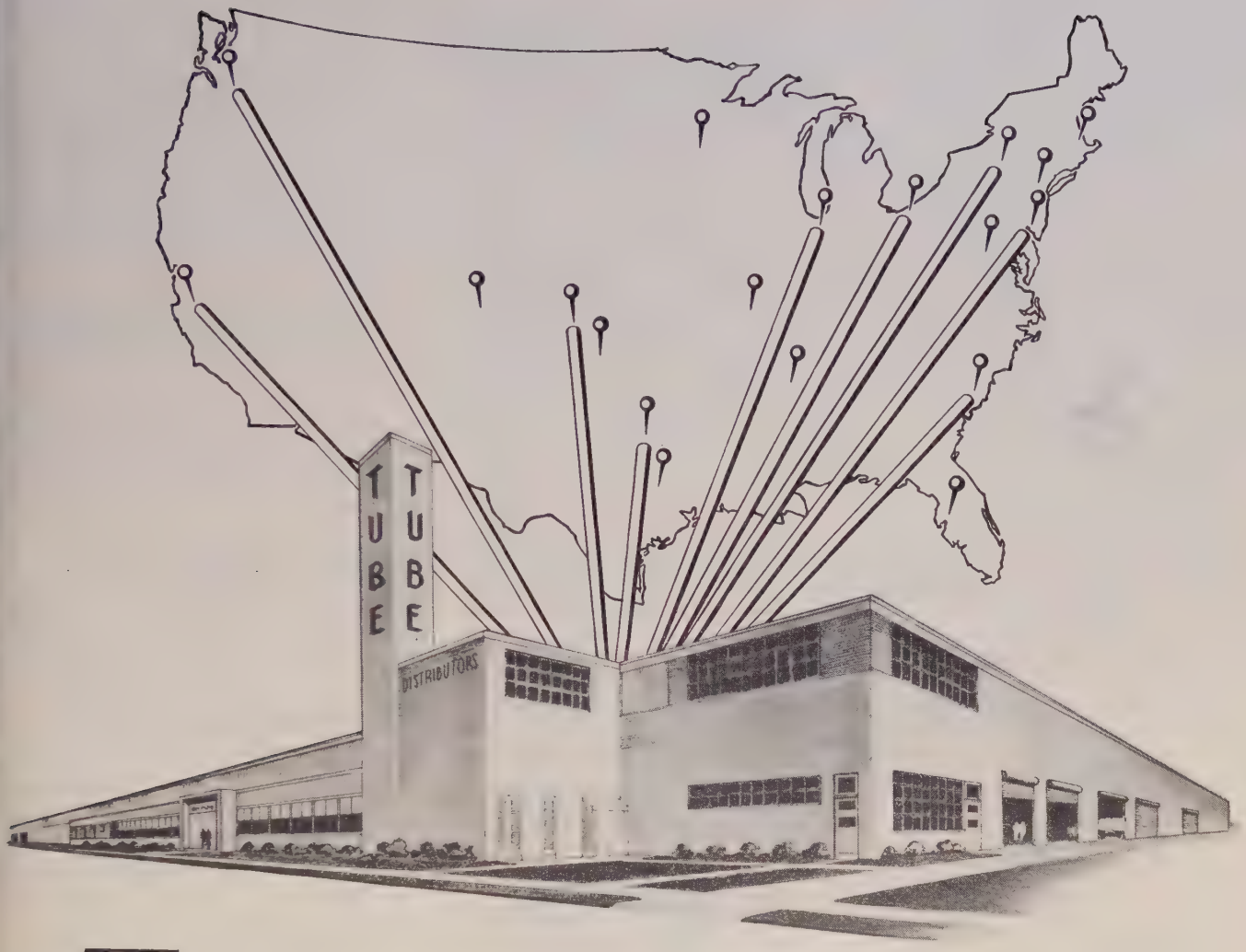
Cincinnati Machinery Co. Inc. moved to its new plant at 3900 Kellogg Ave., Cincinnati 26.

Remington Names Distributor

Remington Arms Co. Inc., Bridgeport, Conn., appointed Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O., as a national distributor for its stud driver and fastener studs.

Sall Metals Opens Refinery

George Sall Metals Co. Inc., Philadelphia, completed its new smelting and refining plant, located at Tulip and Westmoreland streets, that city. The project involved an outlay of $1.5 million. The plant will increase ultimately by



The plant that service built

It was with mingled emotions of pride and gratitude that we moved to our new plant in Garden City, New York. Our pride was the pride of fulfilling an ideal of which the plant itself is a symbol. And our gratitude was for you, our customers, who have made everything possible.

As we glance over the 50,000 sq. ft. of new warehouse space, one thought is uppermost in our minds. It is the thought that now as never before, the ideal of service to which our past has been pledged and our future dedicated, can be fully realized.

Yes, this is the plant that service built, service we hope to have the privilege of proving to you.

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Your non-standard parts can be manufactured *complete* (above) . . . or pre-formed by forging, ready for further shaping and machining in your plant (below). Made by the Kaufman *Double Extrusion* Process, your design is produced with accuracy in dimensional detail—is *stronger* through forging by our process.
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almost 500 per cent the company' capacity to produce alloys of alu minum, brass, bronze, lead and zin

Air Brake Firm Expands

Westinghouse Air Brake Co Wilmerding, Pa., purchased th George E. Failing Supply Co Enid, Okla., producer of portabl drilling rigs for oil, water an mineral exploration.

Corrugated Steel Opens Branch

Corrugated Steel & Supply Co El Monte, Calif., opened a branc office in Fresno, Calif., with Ernes Rohr as the manager. The offic is located temporarily at 708 Bev erly Way.

Luria Moves Chicago Office

Luria Bros. & Co. Inc., Philadel phia, moved its Chicago office t the Board of Trade building.

Plumbing Supply Firm Sold

J. B. Wise Co., Watertown, N. Y. manufacturer of plumbing supplies has been sold to Abe Cooper an William Conover, with Mr. Conove becoming operating head of th firm.

Die Castings Firm To Build

Ambrit Industries Inc. is con structing a plant for zinc and alu

Framed by a "Hot Top"

One of the "hot tops" he is unload ing frames Manuel Torres, laborer i the open-hearth department, Pitts burgh Works, Jones & Laughlin Stee Corp. These clay "collars" serve as in sulators for hot-top ingot pouring

minum die casting adjacent to the present facility at 1288 Los Angeles St., Glendale, Calif. The addition should be in operation by June 1, says Frank D. Yaussi, president.

Will Build Refractory Plant

International Minerals & Chemical Corp., Chicago, will build a refractory specialties plant in Janesville, Wis., having an annual capacity of 75,000 tons. Chief product of the plant will be granular refractory for air application in the patching of metal melting furnaces.

Pittsburgh Corning Corp. Moves

Pittsburgh Corning Corp. moved its general offices to 1 Gateway Center, Pittsburgh 22. The firm makes glass blocks and Foamglass.

Machine Tool Firm Names Agent

General Factory Supplies Co. Inc., Cincinnati, was named distributor in that area for National Twist Drill & Tool Co., Rochester, Mich.

Jessop Expanding on West Coast

Jessop Steel Co., Washington, Pa., plans to continue to increase its operations on the Pacific Coast with the view of eventual manufacturing operations in that section of the country. William W. Britton, Los Angeles, is western manager for the company.

Currier Buys Cleaner Business

Currier Co., Oakland, Calif., purchased from Vokar Corp., Dexter, Mich., its "Dee Tee" cleaner business in its entirety. This equipment is used for vapor degreasing automobile differentials and transmissions. Production is scheduled to start in Oakland after June 1.

Johnston Pump Opens Plant

Johnston Pump Co. of Fresno, a new firm which purchased the Pump Division of Fresno Agricultural Works, Fresno, Calif., opened its building at W. Yolo and Fruit avenues, that city. It is a subsidiary of Johnston Pump Co. of Pasadena, Calif. K. G. Lundie is presi-

(*Please turn to Page* 85)

the A-B-C of M-S-T

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS AT
C LOWER COST

Michigan
Electric Resistance
WELDED
STEEL
TUBING

A Quality Product

A Gasoline
Tank Filler Tube

ROUND
3/8" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
1/2" to 2" 20 gauge, 1" to 2 3/4",
14, 16, 18 gauge
Carbon 1010 to 1025

Michigan Tubing
has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

For automobiles is just another of hundreds of difficult tubing fabrications manufactured in large quantities and at low cost by Michigan for its customers.

The overflow pipe is brazed to the filler tube at two points and the fastener clamps projection welded to the tube. The cam is spot welded to the tube mouth.

If you have not yet examined the possible adaptability of welded steel tubing to your product, Michigan engineers will be glad to discuss with you the many advantages of design simplification, production savings and product improvement made possible by the use of Michigan tubing.

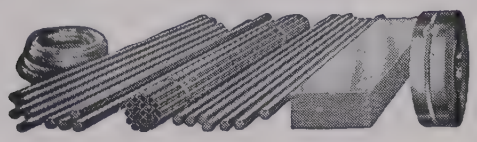
Consult us for engineering and technical help in the selection of tubing best suited to your needs.

Plus Fabricating of our own tubing Michigan is interested ONLY IN THE FABRICATION OF Stainless steel, copper, brass and aluminum tubing.

THE OLDEST NAME IN ELECTRIC RESISTANCE WELDED STEEL TUBING
Michigan STEEL TUBE PRODUCTS CO.

More than 35 Years in the Business
9450 BUFFALO STREET • DETROIT 12, MICHIGAN
FACTORIES: DETROIT, MICHIGAN—SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland Co., Dayton, Ohio—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—Strong, Carlisle and Hammond Co., Cleveland, Ohio—Globe Supply Co., Denver, Colorado—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—Harry E. Clark & Co., Houston, Texas—J. B. Beaird Co., Inc., Shreveport, La.—C. I. Crais Co., Birmingham, Alabama.



BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport BRASS CO. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Sentinel Shower Mixing Valve Improved by Using Duronze III

Teamwork between the product engineer and metallurgist is most essential for products expected to function properly for many years.

Many a properly designed engineering product fails from wear or corrosion when unsatisfactory metals or alloys are used in its construction. Consequently, it pays to consult the laboratory before writing metal specifications.

A Better Mixing Valve

The balanced pressure mixing valve illustrated below is designed to hold the desired discharge temperature of the water by controlling the initial water pressure. It is accomplished not by thermostats, rockers, or springs, but by means of a floating piston or "Sentinel" (shown in the lower right-hand corner of the illustration below). This prevents sudden surges of steam, hot or cold water resulting from "water stealing" down the line. Even if the hot or cold water supply fails entirely, the "Sentinel" will immediately shut off the shower to a mere drip and then automatically restore the flow of water when the pressure returns.

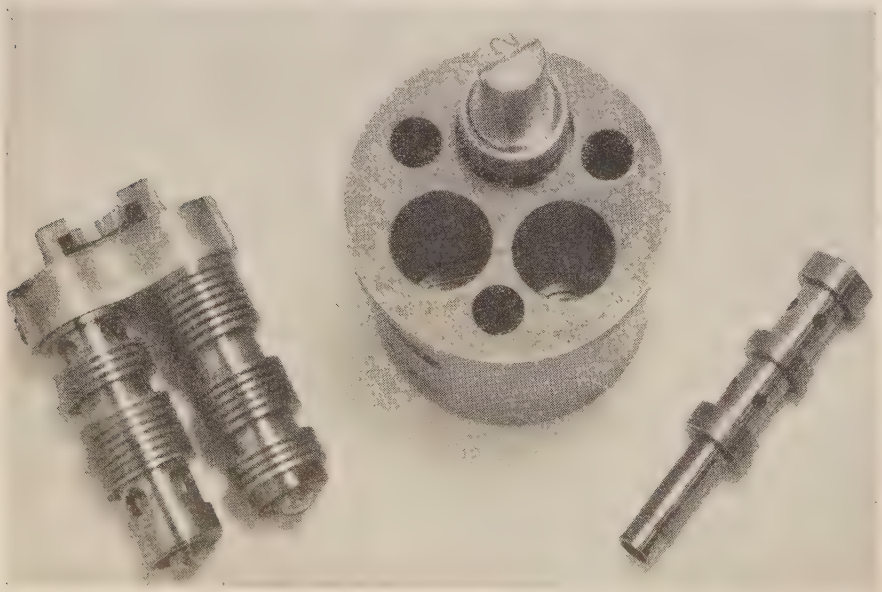
This type of construction calls for extreme precision. Both the plungers and the floating "Sentinel" or piston must work freely in the valve block with very close tolerances. They must not contract, expand or change in size with wide temperature ranges of hot or cold. The metal must be hard and wear resistant. Yet it must have good machinability.

Duronze III, silicon aluminum bronze, containing approximately 91% copper, 7% aluminum, and 2% silicon meets all of these special requirements. In the annealed condition it has a tensile strength in the neighborhood of 90,000 pounds per square inch and a Rockwell hardness of B85. It has a machinability rating of 60% as compared to free cutting brass rod which carries a 100% rating.

Duronze III is supplied in rod form only—for making screw machine parts or for producing hot forgings.

When in contact with another metal or alloy such as brass, it has a low coefficient of friction and withstands wear from rubbing. It also has excellent resistance to corrosion from various types of waters, both hot and cold.

Sentinel shower with any stream head. Courtesy Speakman Company, Wilmington, Delaware.



Plungers (left), valve block (center) where plungers are seated, and Floating Sentinel (right). Courtesy Speakman Company, Wilmington, Delaware.

There are many places where Duronze III parts can impart greater strength, endurance and corrosion resistance to a product. Examples are valve stems for water valves; sleeves for compression fittings to reduce effects of vibration on the tubing; parts for pumps, check valves; water meters, controlling and regulating instruments; wire and cable connectors; oil burner nozzles; bolts, nuts, pole line and marine hardware; small gears, pinions—to name a few.

If your engineering department is getting ready to launch a new item, or is trying to improve an old one, or if your product is failing from excessive corrosion or wear, contact the nearest Bridgeport sales office for help from our metallurgical laboratory. Write for the "Duronze Manual," which contains engineering data on silicon bronze and silicon aluminum bronze.

(9973)

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

Alloy Composition vs. Sodium Carbonate Solutions

In the preceding issues of this column, we have shown that the presence of hydrogen sulfide and chlorine in sodium hydroxide solutions has generally increased the corrosiveness.

Carbon dioxide in sodium hydroxide converts the hydroxide to carbonates:

$$CO_2 + H_2O \rightleftarrows H_2CO_3$$
$$H_2CO_3 + 2\,Na\,OH \rightarrow Na_2CO_3 + 2\,H_2O$$

This tends to lower the rate of corrosion of copper and copper alloys.

Baker's (1) corrosion data for copper shows that the rate of corrosion was 0.0105 ipy in 8-10% sodium hydroxide solution and 0.0031 ipy in 8-10% sodium carbonate solution (in 24-hr. tests at 60°C).

Over a period of time the rate of corrosion of copper and copper alloys in alkaline solutions drops off due to the formation of a dark protective film of cupric oxide or cupric hydroxide. This film results from decomposition of an unstable blue-colored compound which forms adjacent to the surface during the first stage of corrosion. Since copper and its alloys are used in handling sodium carbonate solutions, their corrosion resistance has been determined over a longer period of time.

Sodium carbonate finds wide use in the manufacture of sodium salts, soap, glass; washing wool and textiles; bleaching linen and cotton; general cleanser; softening water; liquid rheostats, etc.

These data show that under conditions which permit the formation of a protective film on the copper or copper alloy surface, the corrosion resistance is satisfactory for many applications.

Under conditions of solution flow against the metal surface or where crevices exist in the design which may hinder the formation of the protective film, it is advisable to use those copper alloys showing the lowest rates of corrosion or change the conditions of use so that the formation of a continuous protective film is assured. For example, in liquid rheostats 70-30 Cupro Nickel has proven more satisfactory than Admiralty (70 Cu, 29 Zn, 1 Sn).

(1) C. L. Baker, Ind. & Eng. Chem. 27, 1358-64 (Nov. 1935).

Corrosion of Copper and Copper Alloys in 0.94 N. Sodium Carbonate Solution. Quiet Immersion at Room Temperature.

(42-day test)

Alloy	Corrosion Rate*
61 Cu, 38.65 Zn, 0.35 Pb	0.00054 ipy
60.5 Cu, 37.25 Zn, 3.25 Pb	0.00074 ipy
66 Cu, 33 Zn, 0.7 Pb	0.00062 ipy
71 Cu, 29 Zn	0.00061 ipy
71 Cu, 27.95 Zn, 1.05 Sn	0.00054 ipy
85 Cu, 15 Zn	0.00051 ipy
100 Copper	0.00040 ipy
98.7 Cu, 1.25 Sn	0.00051 ipy
97.3 Cu, 1.7 Sn, 1.0 Si	0.00081 ipy
96.6 Cu, 2.75 Al, 0.6 Si	0.00017 ipy
94.4 Cu, 5.5 Sn, 0.1 P	0.00027 ipy
70 Cu, 29 Ni, 0.5 Fe	0.00018 ipy

*in inches per year based on loss in weight.

Safety Drill Guide is designed for accurate, fast drilling while protecting template and work from damage. It permits workers to locate the drill accurately in template hole before drill tip can make contact. Is said to protect even unskilled workers. **No. 1303**

Tumbling Mill Degreasing Agent is a finely ground cellulose fiber material said to have high absorbency for degreasing and drying operations in tumbling mills. Absorbs oils, grease or any liquid from metals, plastics and similar materials to more than eight times its own weight. **No. 1304**

Heatless Weld Tool is said to join non-ferrous metals such as copper and aluminum molecularly with a small bond that has greater tensile strength than the metal itself. Tools are offered for joining wire and sheet; are portable compact, light. Device is operated like a pair of pliers. In case of butt welding aluminum wire, is actually work-hardened. **No. 1305**

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Variable Speed Work Positioner has 15½-in. diameter table and is said to carry a load of 300 lbs. at speeds adjustable upwards from ¼-rpm. Offered with foot switch, it operates on 110-v 60-cycle ac. Unit weighs 31 lbs. and is easily portable. Useful for welding, brazing, etc., and for assembly or paint spraying. **No. 1298**

Industrial Cleaner Spray Gun is said to remove the full range of grease, oil, gum and dirt with complete safety to all metals, plastics, rubber or porcelain. Cleaner is odorless, fireproof and non-toxic to skin. Gun can be charged with air from any source in a few seconds, spray is wiped off material without hard rubbing or scoring. **No. 1299**

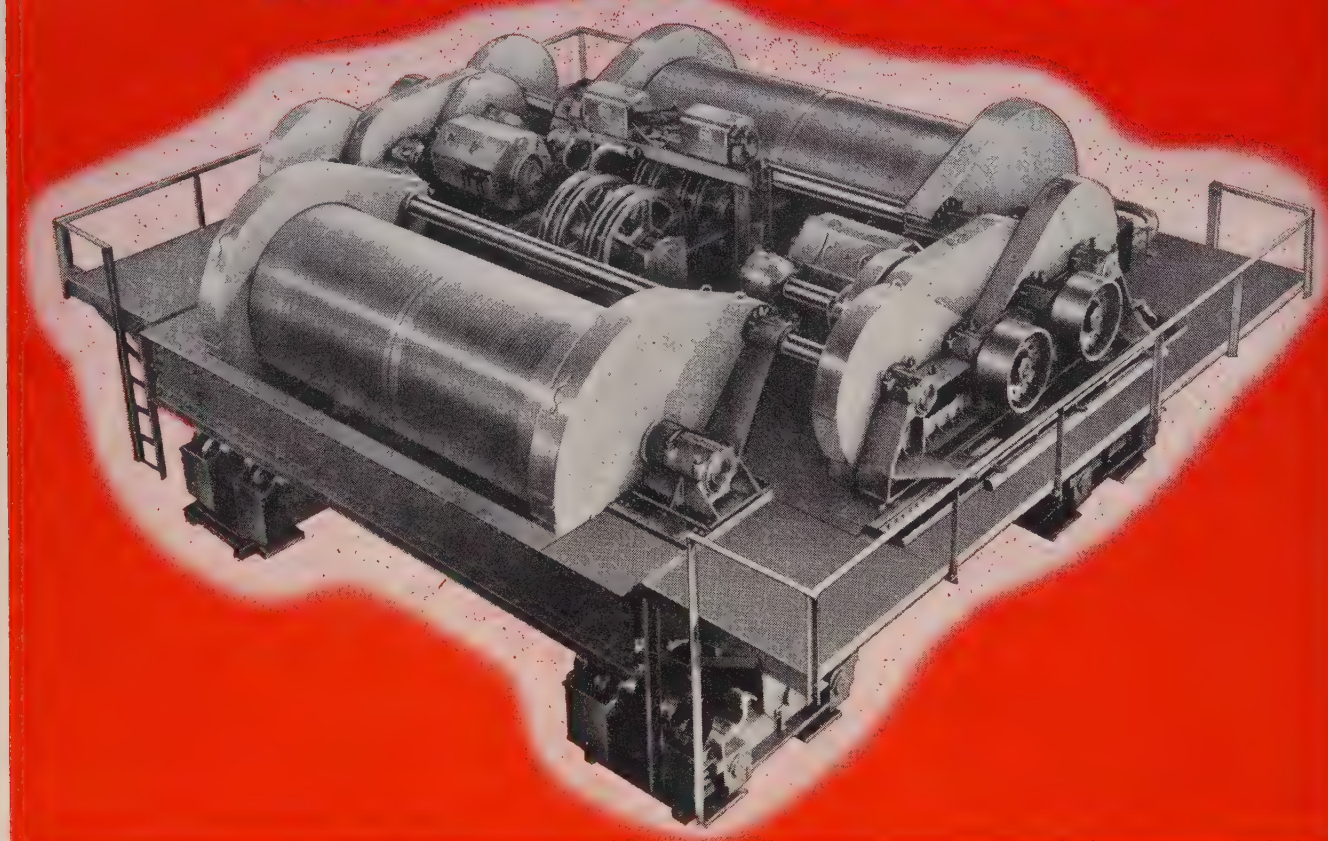
Cutting Torch Guides for individual gas flame torches are said to enable precision cutting of circles, straight lines, bevels and other shapes. Guides fit standard torches and styles include models for 1 to 15-in. diameter circles, 10 to 66-in. diameter circles, straight lines, 60-degree and 45-degree bevels. Guides are easy to attach to torches. **No. 1300**

Audio-Video Inspection Instrument is said to detect noise sources in all types of mechanical equipment. Utilizes headphones for audible operation and a milliammeter for checking sound impulses visually. Germanium crystal diode circuit provides wide frequency response necessary for accuracy. **No. 1301**

Cleaning and Tinning Paste contains powdered solder suspended in a scavenger action flux which is said to clean and tin in the same application cast iron, steels, copper, brass, galvanized and lead-coated steels. Flux is non-active at normal temperatures, but it turns liquid at soldering temperatures, and is strong enough to remove scale and tin black iron. **No. 1302**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities
Advertisement

Reliability *PROVED* by MEEHANITE Cable Drums



HERE is another example of the rapid growth of engineering understanding of the reliability of Meehanite metal in component applications once believed beyond the possibilities of iron castings.

Illustrated is the main trolley for a 250 ton capacity crane built with Meehanite cable drums. The 4 drums required each weighed 14,500 lb., were 8 feet 4 inches long,—had a diameter of 62 inches. Such drums are not an experiment, but are among hundreds of similar units used by the industry because they have established exceptional service records.

Their combination of high compressive strength, toughness, and wear resistance, offers maximum life for not only the drum but for the cable itself.

Such properties, combined so as to meet *your* needs can be "built-into" your component parts. They are the result of the rigid manufacturing controls used in the production of Meehanite castings. Check your needs with your Meehanite foundry FIRST!

MEEHANITE®

NEW ROCHELLE, NEW YORK

MEEHANITE FOUNDRIES

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington and Dover, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry	Providence, Rhode Island
Compton Foundry	Compton, Calif.
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
De Laval Steam Turbine Co.	Trenton, New Jersey
M. H. Detrick Co.	Newark, N. J. and Peoria, Ill.
Empire Pattern & Foundry Co.	Tulsa, Oklahoma
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Hardinge Company, Inc.	New York, New York
Hardinge Manufacturing Co.	York, Pennsylvania
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kanawha Manufacturing Co.	Charleston, West Virginia
Koehring Co.	Milwaukee, Wisconsin
Lincoln Foundry Corp.	Los Angeles, California
London Concrete Company, Ltd.	Brantford, Ontario
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
Palmyra Foundry Co., Inc.	Palmyra, New Jersey
The Henry Perkins Co.	Bridgewater, Massachusetts
Pohlman Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Sonith Industries, Inc.	Indianapolis, Ind.
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

MEEHANITE MEANS BETTER CASTINGS

(*Continued from Page* 81)

dent while W. V. Watters is general manager of the Fresno firm.

Taubensee Steel Expands

Taubensee Steel Co. opened its 11,200 sq ft warehouse adjacent to its original one at 9363 W. King St., Franklin Park, Ill. The new structure will enable the firm to increase substantially its warehousing of nails, wire and other metal products.

Conveyor Maker Changes Name

U. S. Engineering Corp., Milwaukee, changed its name to Jorgensen Conveyors Inc. The firm, which handles the design, manufacture and erection of conveyor systems, will build a larger plant.

Trane Moves Duluth Office

Trane Co., La Crosse, Wis., manufacturer of heating, ventilating and air conditioning equipment, moved its Duluth office to 414 Lyceum building. The firm's St. Paul sales office opened a sub-office at Fargo, N. Dak. Managers of the offices are: Robert T. Dean, Duluth; William McNamara, St. Paul; and George W. Robbins, Fargo.

Tractor Firm Appoints Agent

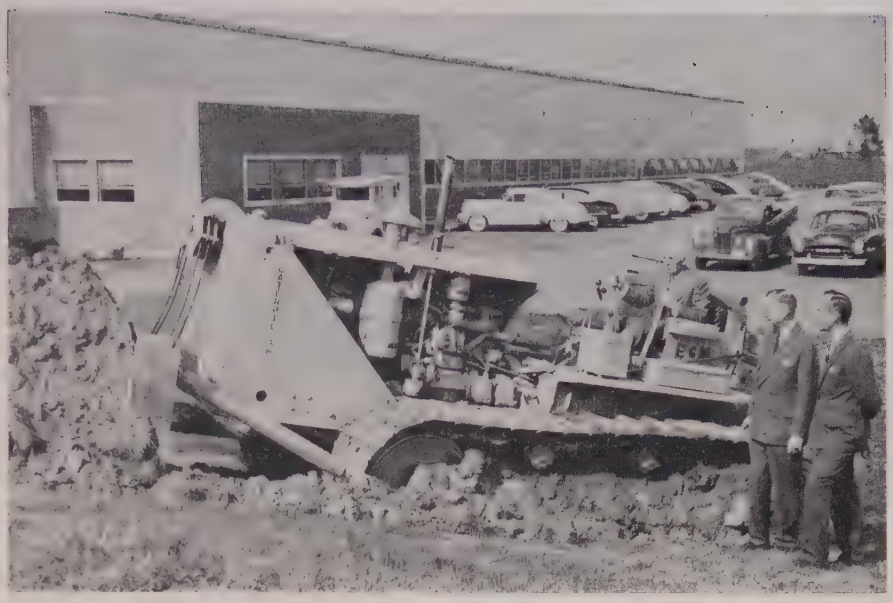
Hensel Green & Co., Chicago, appointed Eastern Industrial Sales Co., New Rochelle, N. Y., as distributor for its industrial tractors.

Brass Firm Buys Rolling Mills

American Brass Co., Waterbury, Conn., purchased two four-high reversing cold rolling mills, complete with auxiliary equipment, for installation at its Torrington, Conn., plant. The order was placed with Lewis Machinery Division, Blaw-Knox Co., Pittsburgh.

A C F Buys Instrument Firm

American Car & Foundry Co., New York, bought Avion Instrument Corp., Paramus, N. J. Avion, which conducts research and develops fire control and missile guidance systems, computer elements and similar electronic devices for both defense and industrial use, will continue under the same management, headed by Richard F. Wehrlin.



Toolmaker Erecting $2 Million Plant Addition

Alonzo G. Decker, president, Black & Decker Mfg. Co., Towson, Md., was in the driver's seat at ground-breaking ceremonies for a $2 million addition to the firm's Hampstead, Md., branch plant (STEEL, Mar. 30, p. 172). Watching are: R. D. Black, vice president, left; A. G. Decker Jr., vice president in charge of manufacturing. The addition will double the size of the branch plant

Metal Producers Merge

Federal Mining & Smelting Co. was merged into American Smelting & Refining Co., both of New York.

Machine Tool Firm Builds Plant

Diamond Machine Tool Co., Los Angeles, is building a factory and general offices in Pico, Calif. The company makes machine tools, including mailing machines, punch presses, shears, lathes, horn presses, OBI presses, radial drills and boring mills.

Opens Roll Covering Plant

Manhattan Rubber Mfg. Co., subsidiary of Raybestos-Manhattan Inc., Passaic, N. J., opened a rubber roll covering plant at Neenah, Wis.

Will Boost Fuel Tank Output

Snyder Tank Corp., Buffalo, purchased a plant near Renovo, Pa., and leased another one at Galeton, Pa. The facilities will be used for additional production of truck fuel tanks, which the company makes in Buffalo, and for manufacture of new items. The expansion program is expected to increase production 200 to 300 per cent over the next two years.

Canoga Corp. Enlarges Facilities

Canoga Corp. is constructing additional facilities for the manufacture of electronic equipment, radar antennas, receivers, and transmitters at 5955 Sepulveda Blvd., Van Nuys, Calif.

St. Paul Hydraulic Names Agents

St. Paul Hydraulic Hoist Division, Gar Wood Industries Inc., Minneapolis, appointed as distributors of its hoists, dump bodies, refuse bodies and elevating end gates: New England Marmon-Herrington Coaches Inc., Somerville, Mass.; and Feree Motor & Equipment Co., Greensboro, N. C.

GE Building Noiseless Room

General Electric Co., Schenectady, N. Y., is constructing a million-dollar building at Pittsfield, Mass., to house "the quietest room in the world for its size." The building will be used to noise-test power transformers; to carry on research to make them much quieter in

operation. Special sound-treated chamber will be 66 ft long, 56 ft wide and 49 ft high—large enough to handle the largest transformers GE now builds or expects to design in the next ten years.

Monsanto Plans Big Project

Monsanto Chemical Co., St. Louis, plans to construct multimillion dollar facilities for the production of isocyanates. Location of the plant has not been announced.

Consolidated Steel Rebuilds

Consolidated Steel Co., Youngstown, will spend about $125,000 in rebuilding a metals warehouse, which was destroyed by fire recently, and in enlarging its scrap yard. Consolidated is a warehousing firm as well as a dealer in scrap.

West Coast Foundry Expands

West Coast Foundry & Mfg. Co., 5738 Long Beach Ave., Long Beach, Calif., producing nonferrous castings, rebuilt and expanded its plant.

Insul-Mastic Licenses Seller

Insul-Mastic Corp. of America, Pittsburgh, licensed Knudsen Co., Syracuse, N. Y., to sell and apply its protective coatings.

Plant Opening Is Scheduled

American Appliance Mfg. Corp., Santa Monica, Calif. will start manufacturing gas water heaters and furnaces at 2425 Michigan Ave., that city, in June.

Graton & Knight Redesigns Plant

Graton & Knight Co., Worcester, Mass., producer of products ranging from leather conveyor belts to junior baseball gloves, is on the second lap of a two-year drive to streamline and redesign its plant, to cost $500,000. Materials handling and processing has been mechanized, quality control equipment installed, and three new lines of products developed. All machinery will be converted from steam to electric power, at a cost of more than $200,000. The company's affiliate, International Packings Corp., Bristol, N. H., is currently carrying forward a companion $100,000 program.

Bridge Shortens Haul

A temporary lightweight span, designed and erected by U. S. Steel subsidiaries, is link in network of conveyor belts carrying aggregates from crushing plant to site of the $29-million Folsom Dam under construction near Sacramento, Calif. The bridge eliminates a long, tedious truck haul

Kinray Industries Moving

Kinray Industries Inc. is moving into a $150,000 factory building in Youngstown. The firm produces rolls for the rubber industry and screw machine products of brass, aluminum and other metals.

Raytheon Firms To Merge

Raytheon Television & Radio Corp. will be merged into the parent company, Raytheon Mfg. Co., Waltham, Mass., on June 1. It will be operated as the Television and Radio Division.

LeBlond Names Representative

R. K. LeBlond Machine Tool Co., Cincinnati, appointed Sales & Service Machinery Co., Philadelphia, as its sales representative in that territory.

Pastushin Industries Moves

Pastushin Industries Inc., Los Angeles, manufacturer of self-sealing rivets, moved to a new plant at 501 N. Prairie Ave., Hawwthorn, Calif., as the latest step in an extensive program of expanding production of aircraft hardware, including aircraft rivets.

Multipack Buys Machinery Firm

Multipack Inc. purchased Multiplex Machinery Co., Elmore, O. and will operate it as a subsidiary division of the new corporation. Multiplex will continue to manufacture fully automatic concrete block machines, mixers, off-bearers, skip hoists and elevators. Officers of the new corporation are: R. A. Parker, chairman; Joseph J. Parker, president; John S. Parker, vice president and sales manager; Lester C. Young, secretary; J. S. Parker, treasurer; A. E. Stitt, general manager; Nelson C. Johnson, plant manager.

Canada Gets New Chain Plant

Round Chain Co. of Canada acquired a plant in Brampton, Ont. Tire chain production will start at once in the new plant, with production of other types of chains scheduled to begin as soon as equipment is installed.

Zinc Institute Holds Election

Directors of American Zinc Institute, New York, elected for the term ending 1956, are: K. C. Brownell and S. D. Strauss, American Smelting & Refining Co.; E. R. Dondorf, National Lead Co.; R. E. Dwyer, Anaconda Copper Mining Co.; Andrew Fletcher, St. Joseph Lead Co.; G. H. LeFevre, U. S. Smelting, Refining & Mining Co.; W. H. Leverett, National Zinc Co. Inc.; Jean Vuillequez, American Metal Co. Ltd., all of New York; Elmer Isern, Eagle-Picher Co., Miami, Okla.; and E. H. Snyder, Combined Metals Reduction Co., Salt Lake City, Utah.

Marshall L. Havey was elected president (STEEL, May 4, p. 57). Vice presidents are: Warren H. Leverett, National Zinc Co. Inc., New York; George W. Potter, Potter-Sims Mines Inc., Joplin, Mo.; and Frank A. Wardlaw Jr., International Smelting & Refining Co. Salt Lake City, Utah. Erle V. Daveler, American Zinc, Lead & Smelting Co., New York, was re-elected treasurer and Ernest V. Gent continues as executive vice president and secretary.

Corrosion won't hurt this TRI CLAD motor's cast-iron frame

REG. U.S. PAT. OFF.

HERE'S A COMMON SIGHT AROUND MANY PLANTS— A G-E Tri-Clad motor operating reliably and continuously under the extremely corrosive conditions that cause many other motors to fail.

THAT'S WHY YOU CAN EXPECT superior performance from G-E Tri-Clad motors. Consider these facts:

CORROSION-RESISTANT CAST-IRON means longer motor life. Unlike steel, cast-iron resists corrosive pitting, even when the paint is chipped.

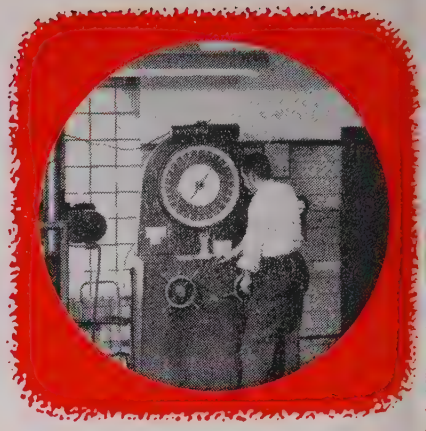
RIGID, CAST STATOR FRAME with integrally cast feet, can't be twisted out of line by accidental jarring or by excessive "bolt-down" pressure on the feet.

STRONG, CAST-IRON END SHIELDS have cast ribs for extra strength without adding extra weight . . . protect the true motor alignment even under heavy shaft loads.

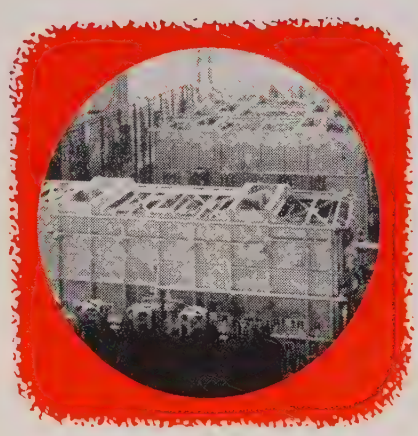
ORDER G-E TRI-CLAD MOTORS from your nearby G-E Apparatus Sales Office or G-E Agent or distributor. General Electric Co., Schenectady 5, N. Y. 752-19

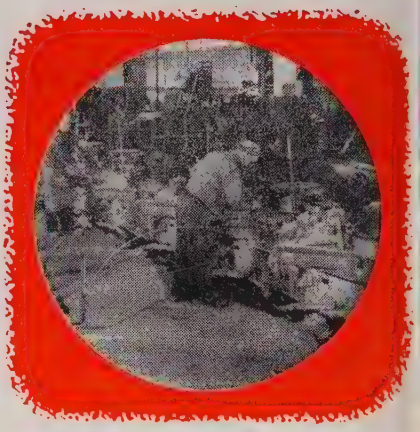
You can put your confidence in—

GENERAL ELECTRIC



Quality — control . . . — every





step — of the — way

Reliance COLD FINISHED STEELS

Our modern plant is at your service to provide special quality steels to meet your specifications. Produced on modern equipment by experienced personnel, our cold finished steel must meet the rigid inspection set up by our metallurgical department before being released for shipment. Eaton-Reliance produces steel in rounds, squares, flats or special shape sections in wire sizes 020 x 020 to ½ to 19/36 in coils or cut to length in the following types: cold drawn, cold rolled, centerless ground, carbon, alloy, stainless, K-Monel, bronze or aluminum.

Quality control checks of the steel are made at every step of production by our chemical and metallurgical laboratory staff. Eaton-Reliance's Steel Mill produces ball and roller bearing quality key stock, cold heading quality and armor-piercing shot steel whose surface tolerance and machineability must meet specific requirements. Let us help you cut your production costs with fine quality steel.

RELIANCE DIVISION EATON MANUFACTURING COMPANY

OFFICE and PLANTS: 514 Charles Ave. MASSILLON, OHIO

Springtites & Sems · Snap & Retaining Rings · Special Steels · Spring Lock Washers · Hoz-Fas-Ner

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

Production and Engineering
NEWS AT A GLANCE

PROGRESS IN SILICONES—Dow Corning Corp., Midland, Mich., has entered an expansion program intended to quadruple facilities for making silicone products, the company informed a group of editors last week. Newsmen were shown a new Silastic plant for production of silicone rubber and a methyl chloride plant and 6000 kva electric furnace installation for producing silicon from quartz rock and coke. Silicone products expected to be important commercially in the future include a new magnet wire enamel serviceable at 180° C. It will free class H insulation from space limitations, make fractional hp and miniature motors practical and increase usefulness of Class H materials in electronic devices.

CASE OF THE SHAKES—One big problem in getting a good finish on a machining operation is that of keeping vibration out of the cut. A certain amount is almost unavoidable, but the vibration due to the machine motor can often be eliminated entirely from the work spindle. One way to do this is to make the machine, motor, and motor mounting so rugged that vibration doesn't have a chance. This will work all right, but it can be expensive and difficult. An easier way is to let the motor vibrate all it wants to, but to keep this vibration from going into the machine. It's relatively easy and inexpensive to do this. A standard motor can be used, which makes for a simple replacement problem for the user. All it takes is the application of vibration-reducing mountings between the motor and machine. p. 90

NEW PICKLING ACID—Nilco Chemical Co. is working on a pickling process based on a new acid which permits continuous removal of sludge from the pickling tank without interfering with operations. Sludge is centrifuged out and automatically loaded on freight cars for shipment back to Nilco. Plans have already been made for evaluation of this process for continuous pickling of hot-rolled strip.

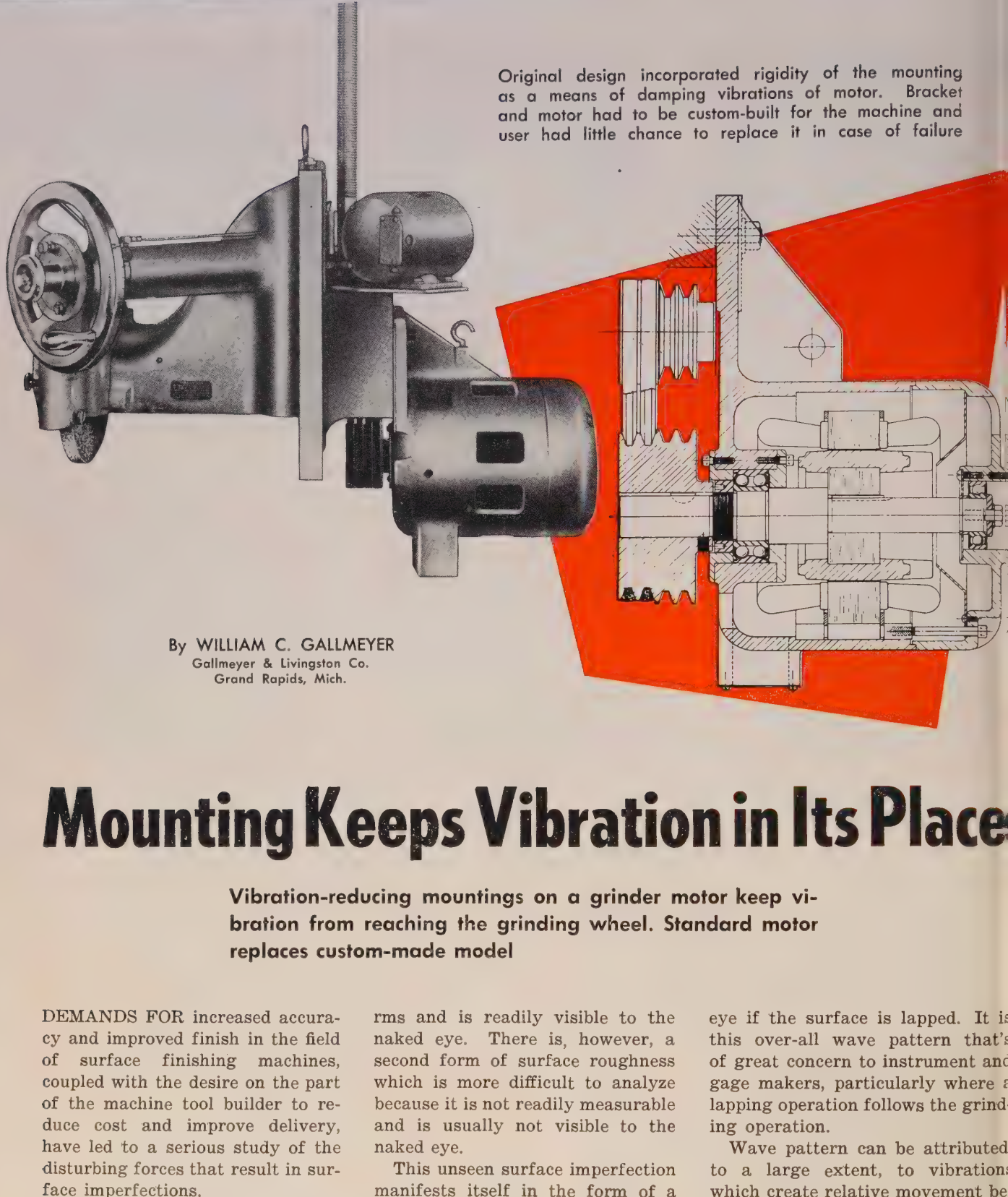
GROWS UP—Vacuum metallizing is an established, low cost, practical process for industrial finishing. The process is simple in principle. You take dull plastic or metal parts, lacquer them to make a glass-smooth surface, then bake the lacquer to cure. Parts are put in a vacuum chamber with aluminum staples fixed to a high amperage source. Air is exhausted to practically zero, and the current turned on so that the aluminum staples just melt and wet the strands of tungsten from which they are supported. Then comes a big boost in current which vaporizes the aluminum staples in a matter of seconds. Millions of aluminum ions shoot off into space and deposit themselves all over the plastic or metal parts. Appearance is that of a brilliant silver plate, and no burnishing is required. The thin bright aluminum coatings may be color tinted by transparent over-coats to give gold, red or blue colors. A second coat of lacquer is needed as protection for the thin metal coating. Production can be speeded up by centrifuging the dip-lacquered pieces to spin off excess liquid. Flash time takes about 14 minutes. By careful preparation, loading and unloading are effected so rapidly that three full cycles are possible every hour. In one plant, 15,000 auto parts are vacuum metallized a day in one medium sized unit. Those most in the know feel that vacuum metallizing will be more widely used in the future in finishing metal parts.

UNDER THE SKIN—Success or failure in your plating operations can depend on your preparation of the surface. Leave some smut or film on the surface—plate over it—and you're on the road to plating troubles. Important consideration—with certain parts and assemblies you may need to use compounds that have special solubilizing action to avoid formation of insoluble films under the plate. Another facet of the story is that treatment of plated coatings and finished parts to produce thin, sometimes invisible films can offer many benefits. p. 92

DON'T PASS THIS UP—Companies applying radioisotopes to quality control or other production operations are saving both money and materials. For example, the Carborundum Co., using radioactive gages in the production of coated abrasives to measure the thickness of materials and final product, expects to save enough money on rejects and shutdowns in a few months to pay for the gages. Such gages are being used by some 200 industrial firms in this country to measure a wide variety of sheet materials as they come off the production line. In Great Britain a package monitor based on the same principle has been developed to measure whether packages are filled to the required level or to the required number of items. Aside from this, other companies are measuring the wear of gears, distributor points, tire tread, machine cutting tools, and floor waxes with radioisotopes.

RECOVERS LOW GRADE ORE—A new process has been developed by Battelle Memorial Institute for recovery of iron from low grade taconite ores. Applicable to a wide variety of taconites, the process is known as the reduction-oxidation process for treatment of nonmagnetic taconites. One present day means of treating nonmagnetic taconite ores involves conversion to the magnetic form by heating, followed by magnetic separation. This has allowed high recoveries of iron content, but a question has been raised on the cost of supplying heat. Battelle's new process may overcome this as it cuts down the amount of initial heat required and has features which permit possible recovery and reuse of heat. A gaseous fuel containing hydrogen or carbon monoxide or a mixture is most suitable.

Metalworking Outlook—p. 39 *Market Outlook—p. 145*



Original design incorporated rigidity of the mounting as a means of damping vibrations of motor. Bracket and motor had to be custom-built for the machine and user had little chance to replace it in case of failure

By WILLIAM C. GALLMEYER
Gallmeyer & Livingston Co.
Grand Rapids, Mich.

Mounting Keeps Vibration in Its Place

Vibration-reducing mountings on a grinder motor keep vibration from reaching the grinding wheel. Standard motor replaces custom-made model

DEMANDS FOR increased accuracy and improved finish in the field of surface finishing machines, coupled with the desire on the part of the machine tool builder to reduce cost and improve delivery, have led to a serious study of the disturbing forces that result in surface imperfections.

When analyzing surface finishes as produced on horizontal spindle surface grinders two distinct types of measurements show up. First basic type is commonly known as a scratch pattern, which is generated by the individual grains of the grinding wheel.

Hidden Waves—In normal grinding practice, this roughness will fall in the range of 5 to 20 microinches rms and is readily visible to the naked eye. There is, however, a second form of surface roughness which is more difficult to analyze because it is not readily measurable and is usually not visible to the naked eye.

This unseen surface imperfection manifests itself in the form of a wave pattern, upon which the previously mentioned scratch pattern is superimposed. In a ground surface, this large wave may have a roughness of six to eight times that of the scratch pattern and still not be readily visible.

Lap Shows Waves—These large surface waves are measurable only with costly instrumentation but become readily visible to the naked eye if the surface is lapped. It is this over-all wave pattern that's of great concern to instrument and gage makers, particularly where a lapping operation follows the grinding operation.

Wave pattern can be attributed to a large extent, to vibrations which create relative movement between the grinding wheel and the workpiece. The exciting forces which cause these vibrations are numerous, but the rotating equipment directly connected to the grinding wheel spindle has been found to be the principal source of trouble.

Pinpoint—Of this equipment the two largest masses are the grinding wheel and the spindle driv

motor. Grinding wheels are effectively balanced by adjustable balance weights in the wheel mounting flange, so electric motors are left as the main source of vibration.

One example of the problem arose on a grinding machine in which the spindle was driven by an electric motor through a V-belt drive. The motor itself was mounted on the spindle head. Any vibration in the motor was transmitted directly to the spindle head and then to the grinding wheel.

Tailor Made — Because commercial motors mounted by conventional means wouldn't allow production of satisfactory ground finishes, it was necessary to design and build a special motor. Rotor and stator portions of a commercial motor were bought. With these electrical components, a special motor was constructed, using a heavy, rigid frame and an oversized shaft mounted on precision ball bearings.

This design incurred all of the problems of precision fits and tolerances, which created a cost many times that of a standard motor. Further costly refinement was a dynamic balancing operation, which was an absolute necessity regardless of the time required. Although this process produced an extremely smooth running motor, the cost of the finished product was several times that of its commercial counterpart.

Shortage—Another disadvantage was the limited supply of rotors and stators to fit this special frame and the fact that the ultimate user of the machine had absolutely no possibility of substituting a standard motor in the event of a breakdown.

Furthermore, it was virtually impossible to supply customers with the various types of motors, such as totally enclosed, fan cooled and explosion proof, which were frequently requested.

Isolationism — To eliminate the disadvantages of the custom-built motor, several attempts were made to redesign the motor mounting to use standard motors. Any new design had to produce a ground finish equal to, or better than, that secured with the special motor.

New design decided on is completely isolated from the mounting and the machine by a vibration absorbing medium. Energies from mechanical unbalance, electrical unbalance and bearing roughness are dissipated within the motor and its associated mounting, rather than in the machine itself.

Better Choice—By careful selection of the isolating medium and proper design of the motor mounting bracket, it was possible to obtain performance equal to, or better than, that experienced with the previous costly, cutom-built design.

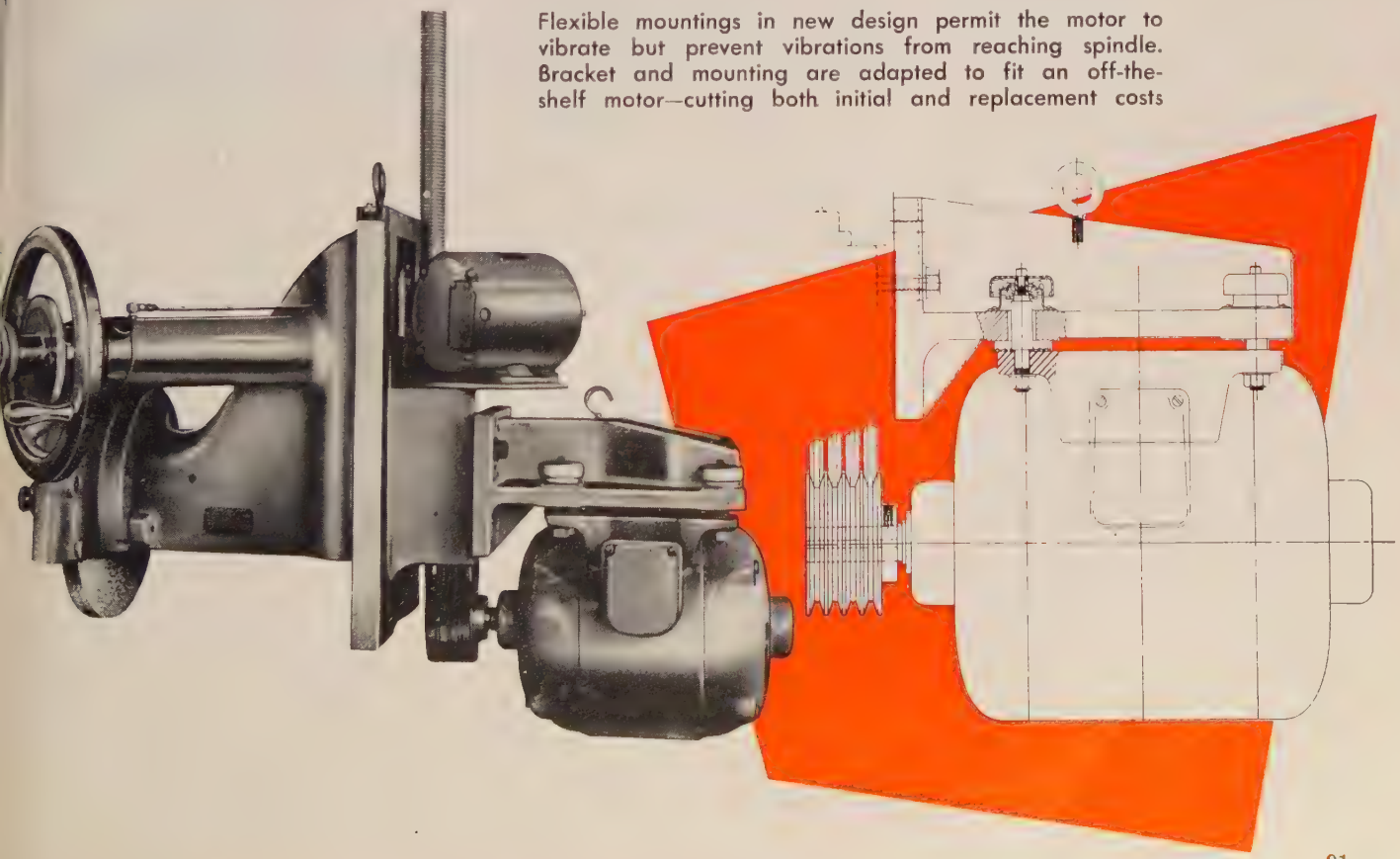
This latest design, using standard off-the-shelf motors, offers a number of advantages to both the machine tool builder and his customers. The machine tool builder is able to supply the user with the type of motor he desires.

Cuts Downtime — At the same time, since the design is based on standard NEMA frames, motors may be obtained from any motor manufacturer, reducing the availability and stocking problems. The machine tool user enjoys better machine performance, with the assurance that, in the case of motor failure, his machine will be out of production only the time required to obtain parts or a complete replacement from the shelf of his local electric motor supplier.

Successful use of standard motors in a precision grinding machine, indicates that custom-built motors should be incorporated in a design only as a last resort.

Presented at the 17th annual Westinghouse Machine Tool Electrification Forum, Pittsburgh, April 14 and 15.

Flexible mountings in new design permit the motor to vibrate but prevent vibrations from reaching spindle. Bracket and mounting are adapted to fit an off-the-shelf motor—cutting both initial and replacement costs



Proper cleaning and surface conditioning of steel and die cast parts prior to plating insures adhesion and durability of the coatings

IT WILL PAY YOU TO EXAMINE . . .

Surface Treatment Methods

Developments in surface treatment make it possible to improve adhesion and durability of plated coatings. Films under the plate are detrimental, whereas films on plated surfaces are beneficial

By DR. ALLEN G. GRAY
Technical Editor

SURFACE CONDITIONING is the key to success or failure in many plating and other finishing operations. What's under the plate? The answer to this question gets right at the root of adhesion and durability of electroplated parts.

Keep this in mind. With certain parts and assemblies it may be necessary to use compounds that have special solubilizing action to avoid formation of insoluble films under the plate. Example: Fluoboric acid pickling of soldered parts prior to nickel plating pays off with increased adhesion of the plate. If conventional sulphuric or muriatic acid is used there's a good chance that insoluble lead salts would be left on the surface. Fluoboric acid works because lead fluoborate, as well as most metal fluoborates, are very soluble compounds.

Research has developed new types of surface treatment especially adapted for etching steel to remove worked metal or smut. Don't short change these new ways for getting a metallurgically clean surface, free from interfering films. They offer a long step in the direction of getting higher bond strength of coatings.

Real Benefits Too — But here's another side of the picture. Treatment of plated coatings and finished parts to produce thin, sometimes invisible films, on the surface offer many benefits. Example: Chromate films resulting from chemical treatment of zinc, cadmium, aluminum, magnesium, copper, and brass surfaces give a high degree of corrosion resistance over what would be expected from untreated surfaces.

Furthermore, chromate surface treatment is one of the cheapest finishing methods for the advantages gained. Why? Low installation cost is typical. Heat requirements are low and ventilation is generally not required. Material cost is usually a few cents per hundred square feet of work. The processing steps are simple and are easily taught to relatively unskilled labor.

Problems of surface treatment for improved plating and better corrosion protection were aired at the 17th annual technical meeting of Boston Branch, American Electroplaters' Society, held Apr. 18.

In discussing important aspects of surface conditioning prior to plating Dr. Walter R. Meyer, Enthone Inc., brought out the fact that worked or distorted metal on the surface influences adhesion of plated coatings. Projections, holes, cracks and loose particles may act as centers of orientation of crystal growth. Where the deposits grow in columnar manner, the crystals will orient themselves normal to the small scale structure rather than normal to the general plane of the cathode. The intersection of systems of crystal growth may be discontinuous and thus can be a source of porosity in the deposit.

Where To Look—Here are some common sources of trouble. The cleaner may build up in metals and there is the possibility that a loose coating or smut may plate on the surface during the cleaning operation, especially if a cathodic cycle is used. Holes in castings are another real source of trouble.

Dr. Meyer stated that carbon smut on the surface is responsible

for a good share of blistering and peeling troubles with plated coatings. Difficulty here actually is due to ability of the deposit to plate over the carbon smut. Surface carbon will influence adhesion, throwing power and corrosion resistance of the deposit.

Something New—Dr. Meyer demonstrated a new process for electrolytic derusting and descaling of metals. Work is made the cathode if rust is to be removed and is alternately made the cathode and anode in case scale is to be removed.

In some operations smut removal is accomplished by making parts the anode only. The solution is also used for etching steel to remove worked metal or smut. Payoff is higher bond strength of coatings and spotting out is minimized. Due to the alkaline nature of the process, simultaneous removal of light oil and organic contamination can be accomplished at the same time as rust removal.

Wide Range—The process will derust or descale almost all types of iron alloys without attack upon the base metal. Tool steels, high carbon steel, cast iron, malleable iron and low carbon steel can be derusted with no attack. Highly polished gages, fixtures, tools, saws, gears, and bearing surfaces can be derusted to leave a bright surface. Regardless of the type of iron alloy treated, no smuts are developed and the surface is not darkened.

Due to the rapid rate of rust removal the process is suited for rapid pickling or descaling of wire sheet or strip for high speed automatic units. High speed pickling of wire has been accomplished using current densities up to 500 amp/sq ft with periodic reverse current, employing 10 second cycles. If the wire can be bent first to crack the oxide by passing it through rollers or wire formers, faster removal can be accomplished.

Oxide coated parts, such as oil quenched heat treated bolts are successfully descaled in barrel equipment. In such cases periodic reverse current is also employed using cycles of the order of 10 seconds anodic and 10 seconds cathodic. Oblique type barrels are satisfactory using a cathode contact made of carbon.

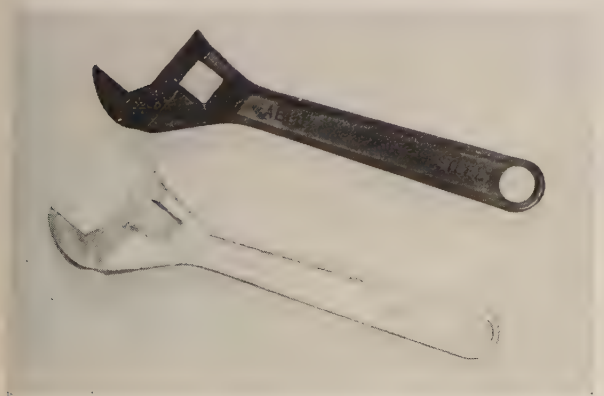
Does Two Jobs — Simultaneous plating and derusting can be accomplished with certain metals. For plating on all ferrous alloys, including cast and malleable iron, cadmium can be added to the solution, and the work is made the cathode. Cadmium oxide of the order of 1 to 2 ounces per gallon is added with sufficient sodium cyanide to dissolve the quantity of cadmium oxide added. Zinc can be plated from the solution using concentrations from 1 to 2 ounces per gallon. However, zinc will not deposit from the solution on high carbon steels, cast and malleable iron. Cadmium should be used in such cases.

Removal of rust from articles containing copper, brass, nickel-silver and silver is accomplished by making the work the cathode with little or no attack upon these metals.

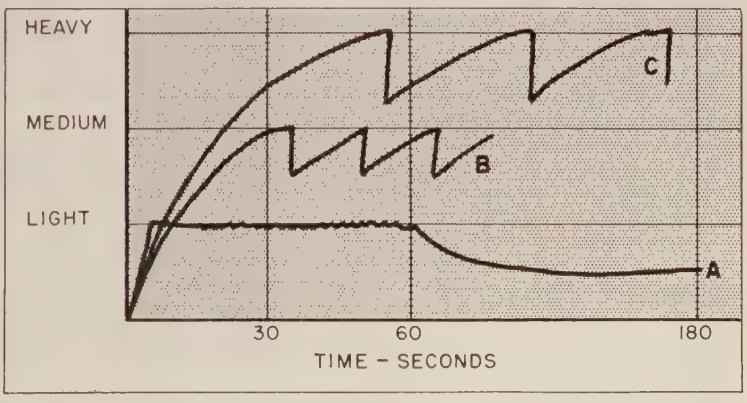
Tough Ones — Here are some tough plant jobs where the new derusting compound is making the going easier: 1. Reclaiming and derusting highly polished valuable ball and roller bearings, tools, gears and gages where no attack on the base metal can be tolerated. 2. Cleaning and conditioning rusty mechanisms without disassembly or harm to tolerances, delicate components or nonferrous metals. 3. Descaling heat treated forged or cast parts prior to machining or processing. 4. Replacing shot blasting, sand blasting or sand rolling for scale removal of small parts in bulk.

Look Here — Surfaces properly conditioned by chemical treatment have high-degree corrosion resistance. Many recent advances have also been made in this direction. Chromate films formed by reaction between a metal surface and an acid chromate solution are widely used. If you add up the benefits it soon becomes obvious that you may gain valuable surface properties other than just improved corrosion resistance.

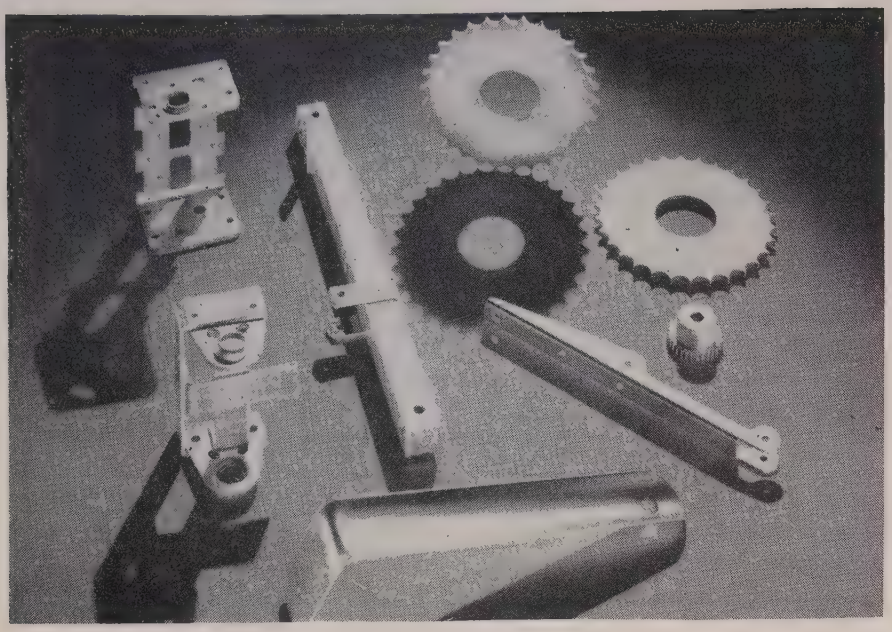
But improved corrosion resistance is at the top of the list for a number of applications. In discussing the protective value of chromate coatings before the Boston Electroplaters' meeting, R. Stricklen, Allied Research Products' development engineer, cited the following important properties of these coatings which contribute to corrosion protection: 1. Once the films are thoroughly dry, they are not easily rewetted by water. 2. Their nonporous structure assists in keeping corrosive media away from the metal. 3. Much of the hexavalent chromium contained in the films is soluble and leaches out into the moisture condensed from a corrosive atmosphere. This sol-



Forged alloy wrench was descaled and cadmium plated in one operation with Enthone's Alkaline Derusting process



These curves from Allied Research Products' data show formation rate of different types of chromate coatings



Steel parts, zinc plated, chromate treated and bleached in dilute phosphoric acid. Bright finish produced by bleaching has good corrosion resistance

uble chromium has an inhibiting action on corrosive environments.

Hidden Benefit — The soluble chromium in the film is available for protection of abraded areas, even though the underlying metal may be exposed. Mr. Stricklen pointed out that this is not generally true of hard surface conversion films. For example, the hardness of anodic films on aluminum is well known and may be advantageous in some cases. However, a scratch which exposes the metal is an immediate source of corrosion since aluminum oxide is insoluble and can protect only the area it covers. If a chromate treated piece of aluminum is scratched in the same manner, the exposed metal will be protected to a considerable degree by the soluble chromium compounds in the coating adjacent to the scratch.

Here's How They Form—Chromate films are formed in a solution containing chromic acid or dichromates and one or more organic or inorganic acid radicals used as activators and modifiers. Metal being treated dissolves in the solution reducing some of the chromium from the hexavalent to the trivalent state. As the metal dissolves, the pH of the solution at the metal-solution interface is raised to a point at which the trivalent chromium precipitates in the form of a gel. Combined in the gel are varying amounts of the hexavalent chromium from the solution and compounds of the metal being treated. The nature of the precipitated coating is governed by the pH of the main body of the solution, nature of the catalyst radicals, and ratio of their concentrations to that of the chromium compounds.

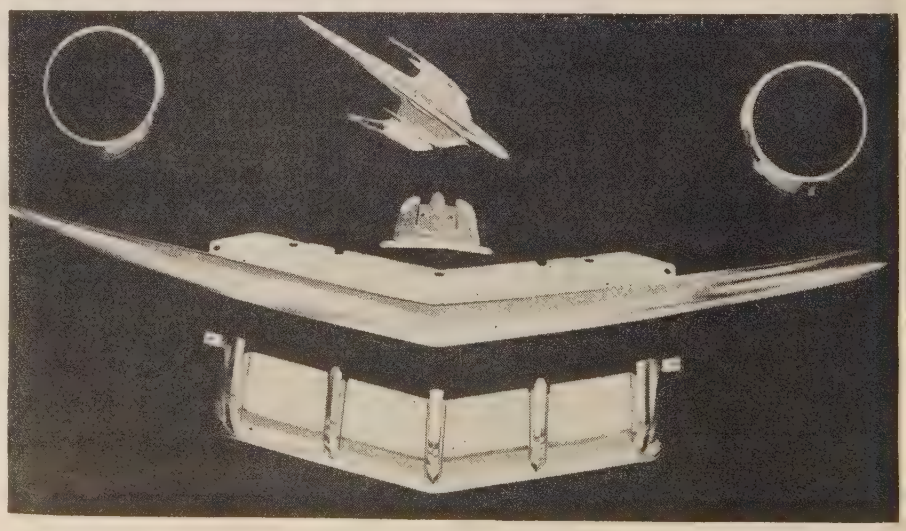
First extensive use of chromate treatments was on zinc parts and zinc plated steel articles. Chromate dips also benefit cadmium plated surfaces. For several years chromate conversion treatments have been used for aluminum. Economic advantages over anodic treatments and certain other properties have led to wide application here. Several types of chromate treatments are available for magnesium. A less widely used application of chromates is for brightening and tarnish resistance on copper and brass. Such solutions eliminate the source of corrosive fumes found in the old standard sulphuric-nitric bright dip.

Zinc and Cadmium—Mr. Stricklen told the electroplaters that a chromate bath producing the light type of film operates in a pH range of 0.0 to 1.5. The reaction starts rapidly, forming a film in 5 to 10 seconds, (curve A in chart). The reaction products re-dissolve continuously and the process continues to go on as a chemical polishing operation.

Rinsing the work leaves a bright iridescent yellow surface which may be cleared by bleaching. A dilute solution of sodium hydroxide or of phosphoric acid leaves a clear surface of maximum reflectivity. The residual film will protect against white corrosion in salt spray for 24 to 48 hours.

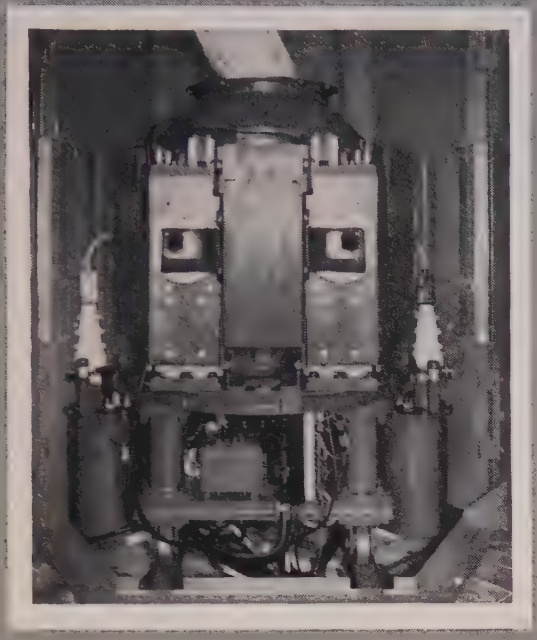
A warm solution of sodium carbonate used as a bleach will remove the yellow constituent from the film, leaving iridescent shades of blue, green and red. This film is more protective than the complete bleach, standing salt spray exposure of 48 to 96 hours. It is an ideal base for a clear lacquer.

Medium—A medium weight chromate film builds up to maximum thickness in about one-half minute (curve B in chart). Continu-



Steps used to give these zinc base die castings a durable bright finish were as follows: Buff, zinc plate, chromate treat, bleach in sodium carbonate and lacquer. Bleached chromate film gives good base for lacquer

NEW ADVANCES



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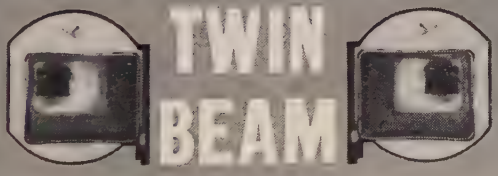

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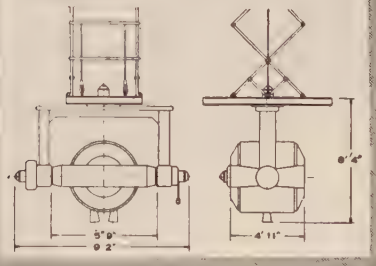

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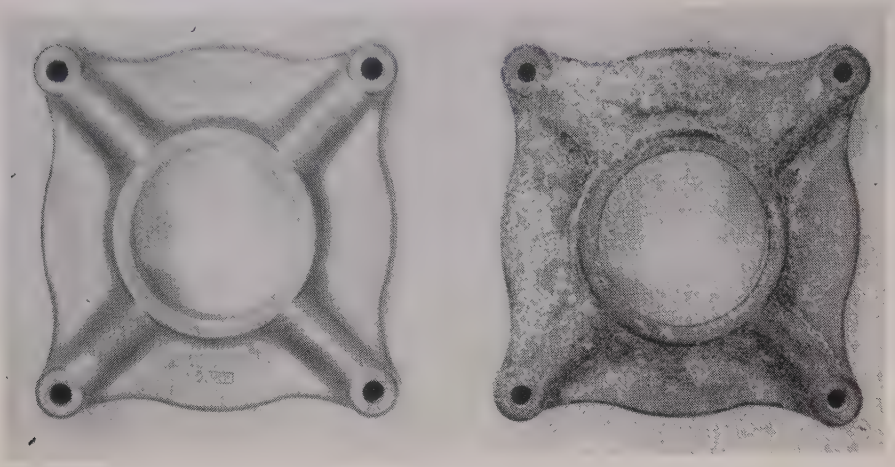

These die cast aluminum alloy #13 parts were given 168 hours salt spray test. Left part was given Iridite chromate treatment; right was untreated

ous immersion causes it to slough off due to its own weight. At this point a second film builds up and the process is repeated. These solutions operate in a pH range of 1.0 to 3.5. Little chemical polishing occurs and the films are light to dark iridescent yellow in color.

By operating at lower concentration and higher pH the process may be slowed to the point where immersion times up to three minutes may be used without danger of sloughing. A slow time cycle works best with some types of automatic equipment. Mr. Stricklen cited salt spray resistance of the order of 100 to 200 hours for the medium type of chromate coatings.

Puts It On Thick — Heavy films are formed in solutions operating in a still higher pH range, usually 2.5 to 3.5 (curve C in chart). The rate of formation is slower—30 to 45 seconds. Extended immersion causes the same sloughing action that occurs with the medium weight films. Color of this type film is olive drab and salt spray resistance is generally 200 hours or higher.

Electrolytic processes for chromate treatment operate in a pH range of 5.0 to 6.0. One process forms a yellow film which can be bleached to a clear surface if desired. Another produces a black coating.

Aluminum — Chromate solutions for aluminum operate in the pH range from around 1.3 to 2.5. Color of the film varies from clear through iridescent yellow to brown and depends on the solution concentration, pH, degree of agitation of the parts, alloy being treated, and immersion time used. In simple dip operations the film reaches its maximum thickness in 2 to 6 minutes immersion.

Corrosion resistance gained by the yellow type film ranges from 200 hours salt spray resistance on high copper castings to 1000 or more hours on alloys such as 52S and 56S. Immersion, spray, brush, flow coating and steam gun applications have all been used.

Bonus Properties—The chromate process gives electrical properties unusual in aluminum treatments. According to Mr. Stricklen, dc surface resistance is low enough for ground connections in many applications. Conductivity for radio frequency is quite high making its use on shields and wave guides quite feasible. This combination of conductivity with corrosion resistance has been valuable in a number of uses in electronics. Another valuable property of chromate coatings on aluminum is weldability. The inert gas shielded arc method of welding may be used without prior removal of the chromate film. This allows treatment of large assemblies in sections.

Magnesium — For a number of years two types of chromate treatments were used for magnesium. Both were developed by the Dow Chemical Co. The Chrome-pickle was used primarily as a mill finish for castings. It forms a relatively thin film, rapidly. However, the reaction continues to go with the greater part of the product being redissolved as fast as it is formed. The Dichromate treatment applies a relatively heavy brown film which forms more slowly, taking about 30 minutes to complete the process.

A new chromate treatment developed by Allied Research Products combines certain properties of both these established methods. Objective: to form a heavy film quickly. Corrosion resistance is up to the high standards of the Dichromate process. The coating is ductile and does not flake when the metal is deformed.

Copper and Brass — Chromate treatment solutions for these metals are rather highly acid. One type forms an invisible film which will retard tarnishing. The surface is cleaned rather than chemically polished. Immersion for a few seconds gives a brightening action but if treated longer a crystalline etch may result.

Another type solution acts as a chemical polishing bath. The presence of the chromate film protects the low spots on the surface while action is more rapid on the high spots. Result: a mirror surface. On rinsing work treated in this solution an iridescent film is formed, similar to that produced on cadmium and zinc. If maximum protection is needed this film is left on the work.

Fluoborates Grow — Information on fluoboric acid for pickling metals not soluble in other acids such as sulphuric or hydrochloric, previously mentioned, was brought out at the Electroplaters' meeting by A. E. Carlson, General Chemical Co.

The Fluoborates are also a new tool for the plating industry. Formulated solutions of lead and tin fluoborate are used to prepare baths for lead plating, tin plating and lead-tin alloy plating. Copper fluoborate is being used for plating steel wire at current densities of 800-1000 amp/sq ft. One user plates over 1½ million feet of steel wire per year using the fluoborate bath.

According to Mr. Carlson, iron fluoborate plating baths show great stability toward sludging. Soldering iron tips built up repeatedly with iron, plated from fluoborate solutions, give increased life of 400 to 1600 per cent.

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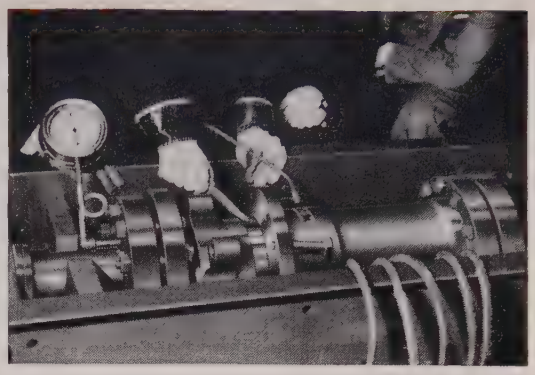
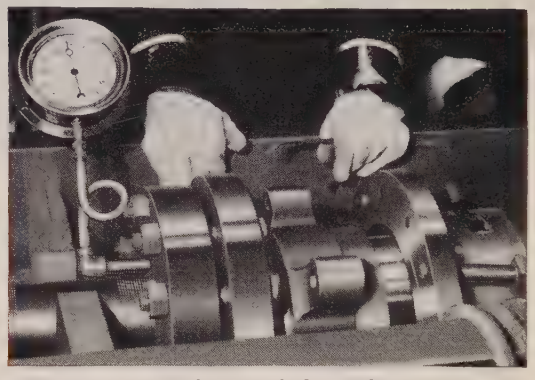


Last strand of packing being withdrawn from stuffing box.



Close-up photograph shows all packing removed. With steam at 240 lbs. pressure and with 300° superheat there is no trace of steam in the empty stuffing box.

With periodic adjustments of the gland, it may never be necessary to repack the stuffing box in an ADSCO piston-ring expansion joint. However, lack of maintenance may make it necessary at some time to do so and the job is easy with this ADSCO joint. The piston rings hold the line pressure during the unpacking and repacking operation. With the vent valve open, the vent chamber is at atmospheric pressure and, under this condition, no steam can enter the stuffing box space. Thus complete repacking can be done under full line pressure.

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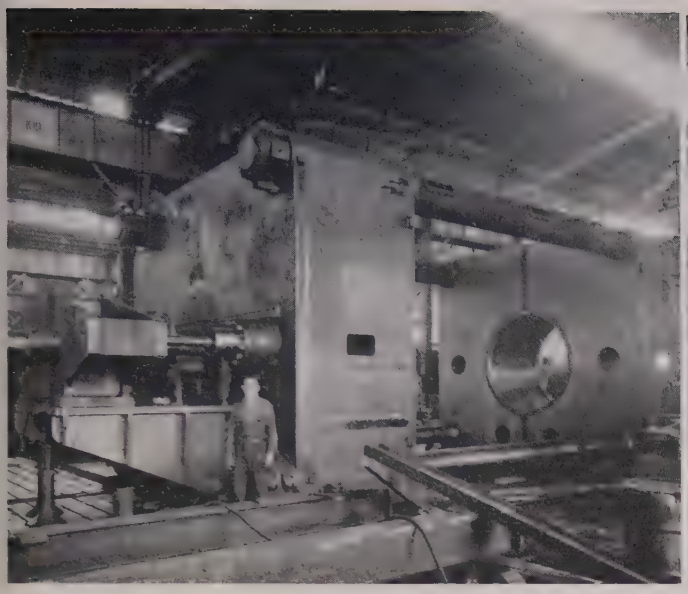
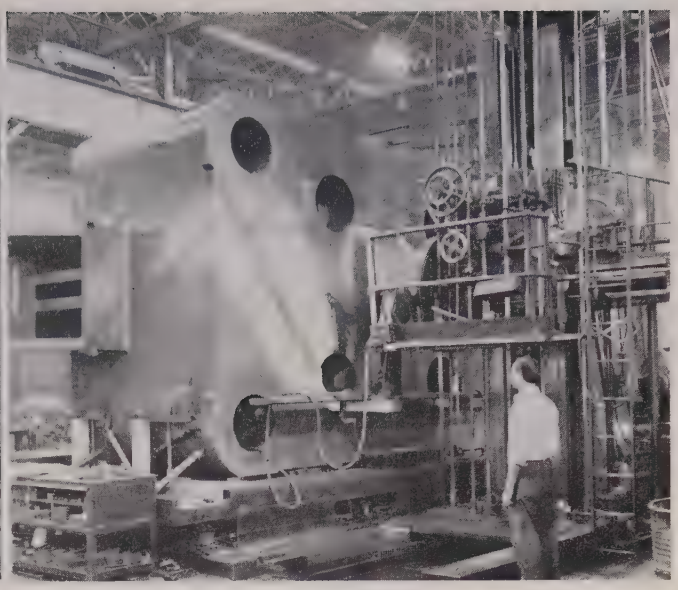


Side platen structure weighs over 200 tons. Left hand platen has its horizontal ram and pullback in place

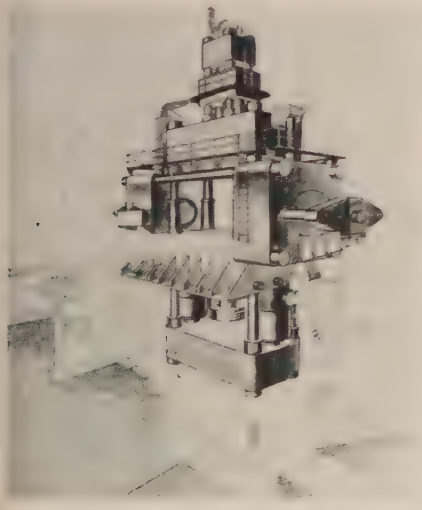


Massive top moving-down platen, in the process of machining on horizontal boring mill, weighs almost 150 tons

Biggest Split-Die Forge Nears Completion

Pull-down press rated at 11,000 tons will join 5000-ton model at Cameron in Houston. The side rams alone exert a 6000-ton push on the dies

NEARING completion in the Southwark shops of Baldwin-Lima-Hamilton Corp., is what will become the largest split die forging press in the world. (STEEL, Jan. 12, p. 66). Upon erection in the plant of Cameron Iron Works Inc., Houston, Tex., the press will stand as high as a six-story building and the supporting foundation will contain a pit 40 feet deep.



Artist's conception of the completed press shows foundation, lower press design. Total height is 60 feet

The pull-down type press, with a capacity of 11,000 tons, will be equipped with a piercing ram at the top and knock-out ram at the bottom; and two horizontal side rams for clamping vertically split dies, or for piercing when using horizontally split dies.

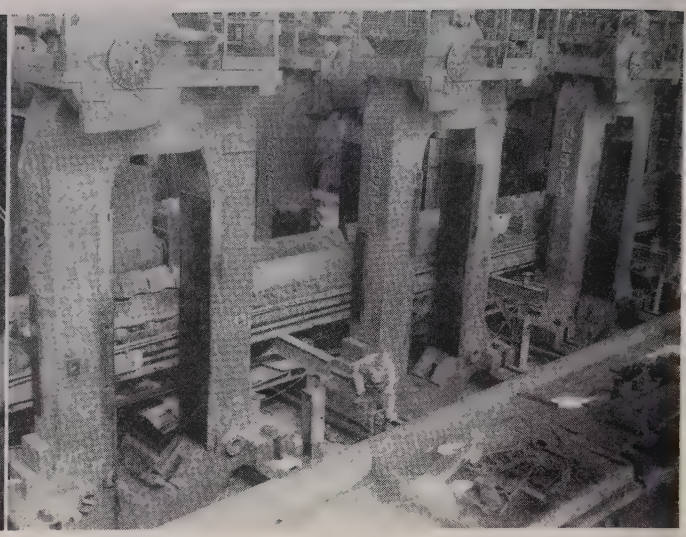
11,000-Ton Pull — Main pull-down capacity of the press will be supplied by two 51-inch diameter, 60-inch stroke, single-acting cylinders of 5500 tons. Two 18½-inch cylinders, with a net stripping capacity of 300 tons, will be used as pullbacks. With a bolster area of 10 x 10 feet, the press will have a maximum vertical opening of 12 feet and maximum horizontal clearance between side-ram faces of 15½-feet.

Two horizontal side-ram cylinders, each made from a single steel forging, have a capacity of 6000 tons at 8000 psi. Each ram is 48 inches in diameter with a 24-inch stroke, and two pullback cylinders on each side have a total capacity of 500 tons.

Other Data—Top piercing capacity of 3000 tons is furnished by a single 38-inch diameter, 24-inch stroke cylinder. Two pullback cylinders will supply 300 tons net stripping capacity. The piercing ram extension contains a motor driven spindle threaded on its lower end to engage the piercing tool. A double-acting bottom piercing cylinder will have 750-ton piercing and 280-ton pullback capacity.

All of the platens, base, etc., for this mammoth machine were fabricated from steel plate, some of which is 6½ inches thick. Before welding, it was necessary to preheat the plates with gas torches. After each part was fabricated complete with bracing plates, column husks, etc., it was placed in Baldwin's heat treating furnace for stress relieving. Some idea of the amount of electric arc welding and time involved to fabricate plates of such thickness can be visualized by the fact that 64 miles of welding wire went into the job.

Tearing out this 36-inch continuous hot strip mill and getting the new 56-inch line in operation with minimum of production loss was the challenge to the work crews



Housings for the six new finishing stands were positioned adjacent to the old stands and were bridged with temporary tables. This was 55 days before Down-Dav

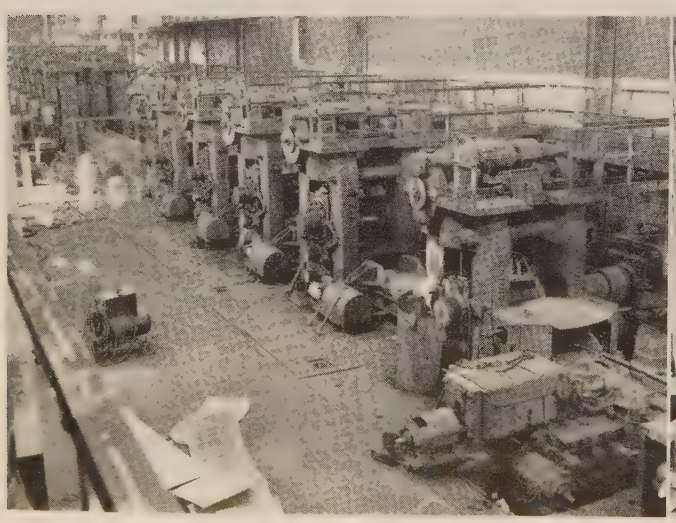
Strip Mill Does A Quick Change

Replacing one continuous mill with another of larger size and having it producing within 15 days is a neat trick. Careful planning and execution pay off

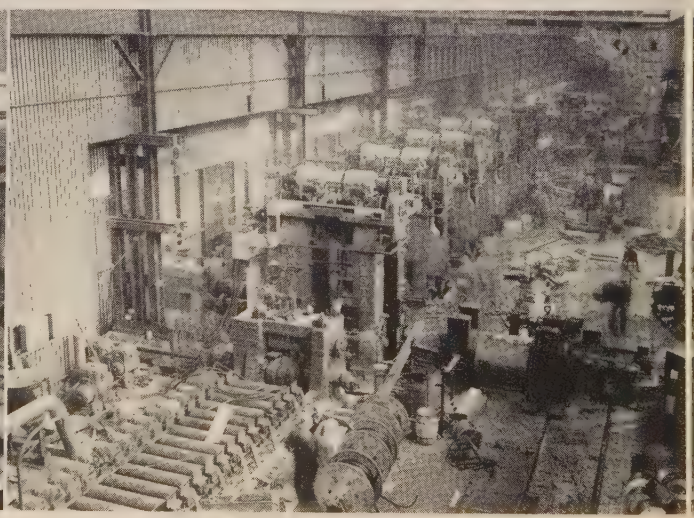
PRODUCTION from a strip mill at Allegheny Ludlum's Brackenridge Works was stopped only 15 days when the company replaced an old 36-inch mill with a new 56-inch six-stand finishing train. Part of a completely new hot strip mill, the new facilities were set up on the same centerline as the old continuous hot strip mill built in 1932.

Months before the shutdown date, with the old mill still operating, roll stand housings, pinch rolls and down coilers for the new mill were erected. Every part of the construction that could be handled without disrupting mill operations was done before the shutdown period. With everything in readiness for round-the-clock activities, the last strip was rolled through the old mill.

Old Mill Vanished—Seven days after the shutdown, the four old



Last strip had just been rolled and removal work on the old stands begun just after this photograph was made. The new roll stand housings can be seen at extreme left



With seven days gone, work is progressing on new stands. Cables are being pulled through and electrical connections made. New delivery tables are in the foreground

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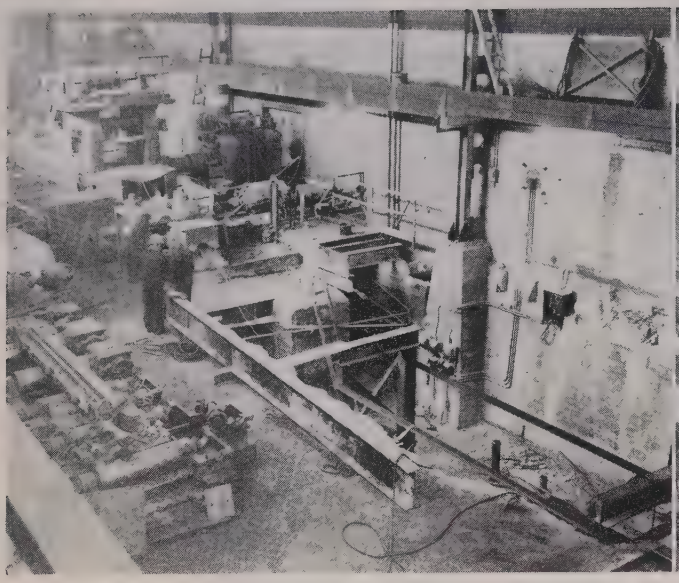
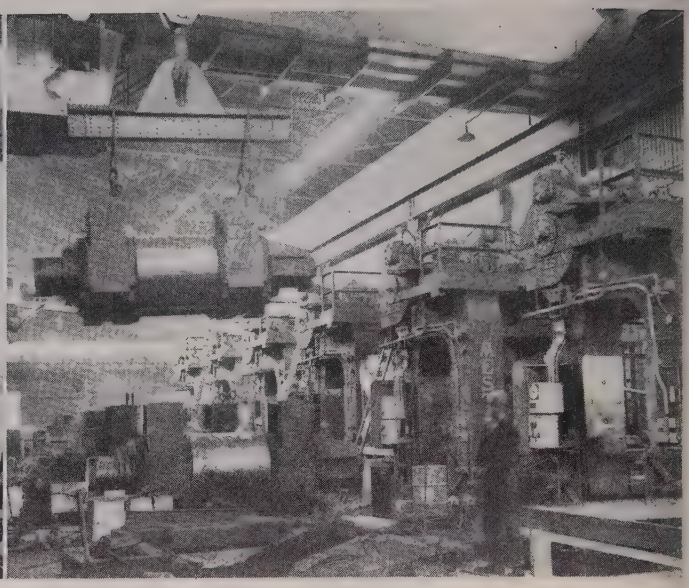


Seven days to go and the old mill has disappeared. Still standing is No. 3 roughing mill which will work with new line until new universal mill is completed



Down-Day plus nine, and the first roll goes into the new stands. Special requirements for rolling stainless and alloys tightened electrical and mechanical specs

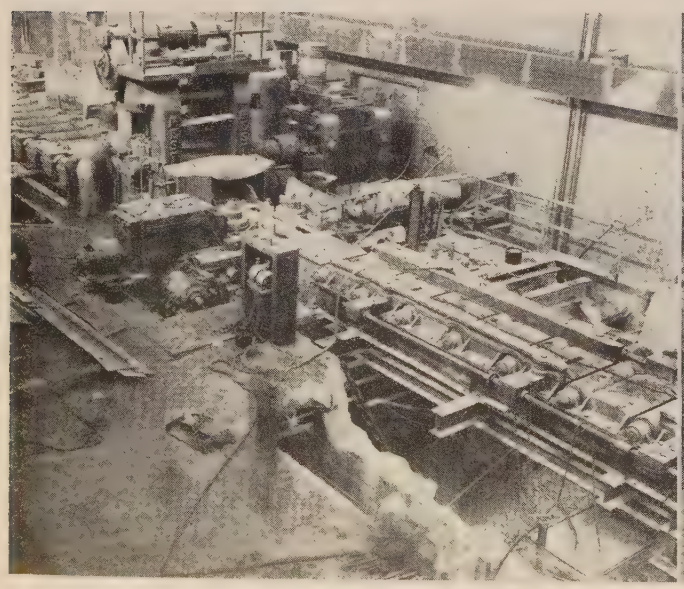
finishing stands had been removed. Only the No. 3 roughing mill, destined to work in the new line until a new universal reversing roughing mill replaced it, remained standing as the erecting crew began putting rolls into stands and making the electrical connections.

Eleven days after D-day the entry tables between the roughing stand and the new mill were almost completed. Temporary tables were placed on stilts over the foundations for the new roughing mill. The four main drive motors from the old mill had been moved to the new locations to form part of the drive for the new mill. Work was proceeding on schedule for a warm-up run the day before actual rolling commenced.

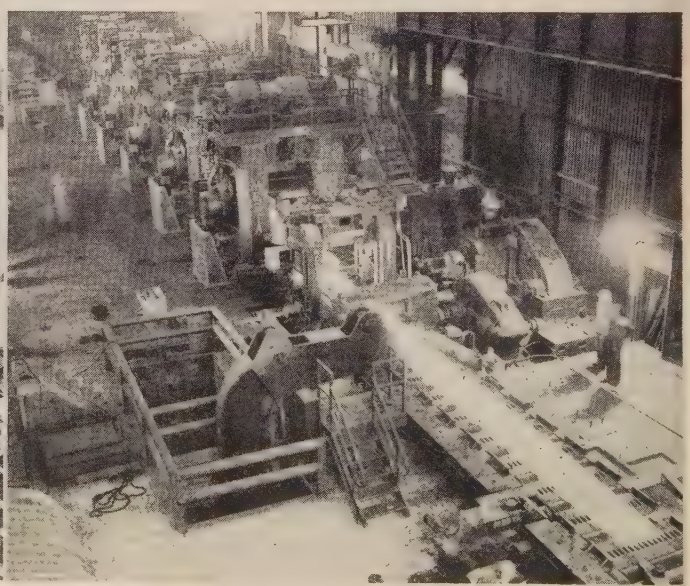
Ready to Go—On the fourteenth day after the shutdown the new stands were given a dry run and everything was in readiness for the first strip. With resumption of rolling operations the next day, fifteen days after the last strip came off the old line, the Brackenridge Works was back at full capacity.

In addition to the complexities of usual construction jobs, much engineering study went into the planning of this one because the changeover came at a time of peak demand, and a minimum loss in production was a fundamental requirement.

Actual construction work and installation was planned by the A-L Engineering Department and was carried out by company crews.



Eleventh day and the entry table is almost completed. Temporary table installation at right is on stilts over the foundations for the new roughing mill to come later



On the fifteenth day after shutdown, the first production starts from the new 56-inch mill. Construction and installation was carried out by Allegheny-Ludlum

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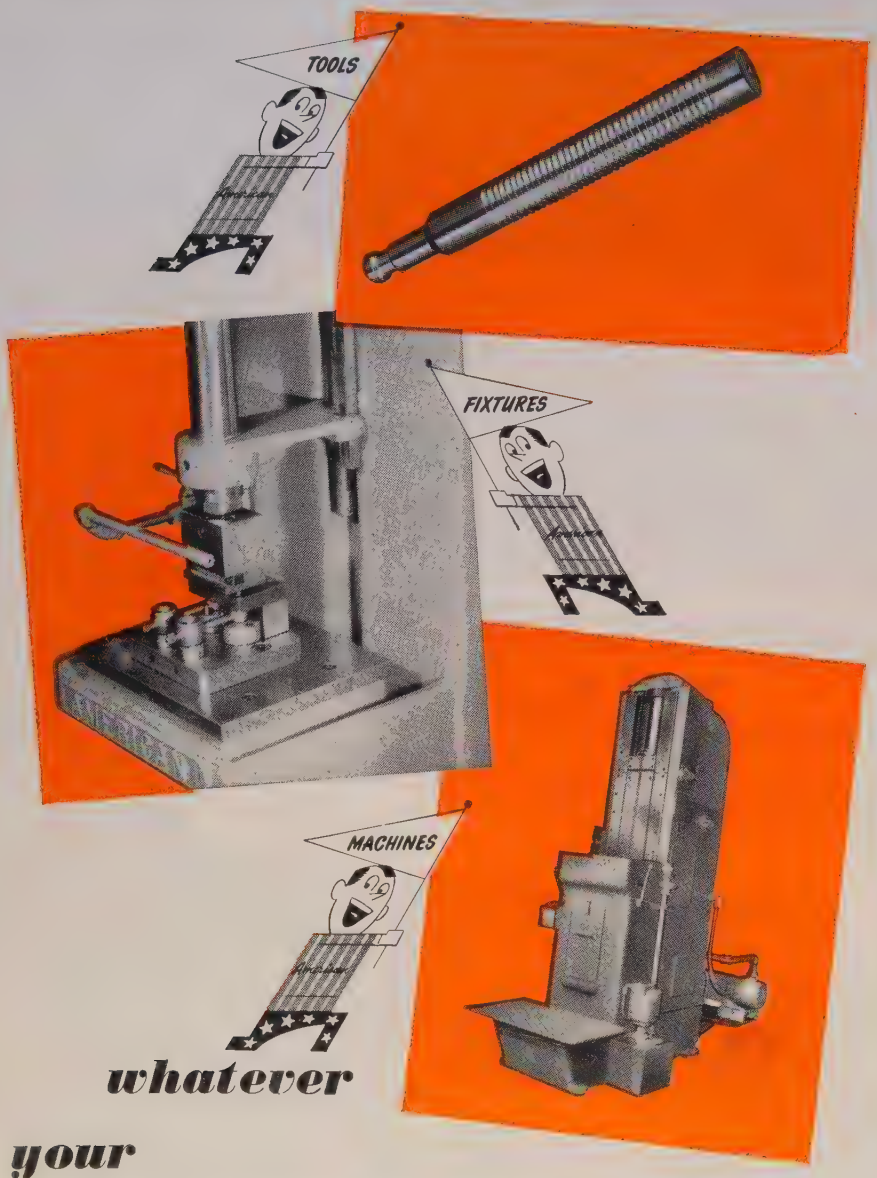

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Clues to Stronger Metals

Work with laboratory-grown "perfect" crystals at GE shows importance of tiny defects

TINY but perfect crystals, produced in the General Electric research laboratory, may provide a clue to metals many times stronger than those now in use, a G-E metallurgist disclosed.

Speaking before the seventh annual New England regional conference, Institute of Metals Division, American Institute of Mining & Metallurgical Engineers, Dr. J. Herbert Hollomon, manager of the metallurgical research department, told of the work of two scientists in making microscopic crystals of zinc, zinc sulfide and mercury without defects that are usually present.

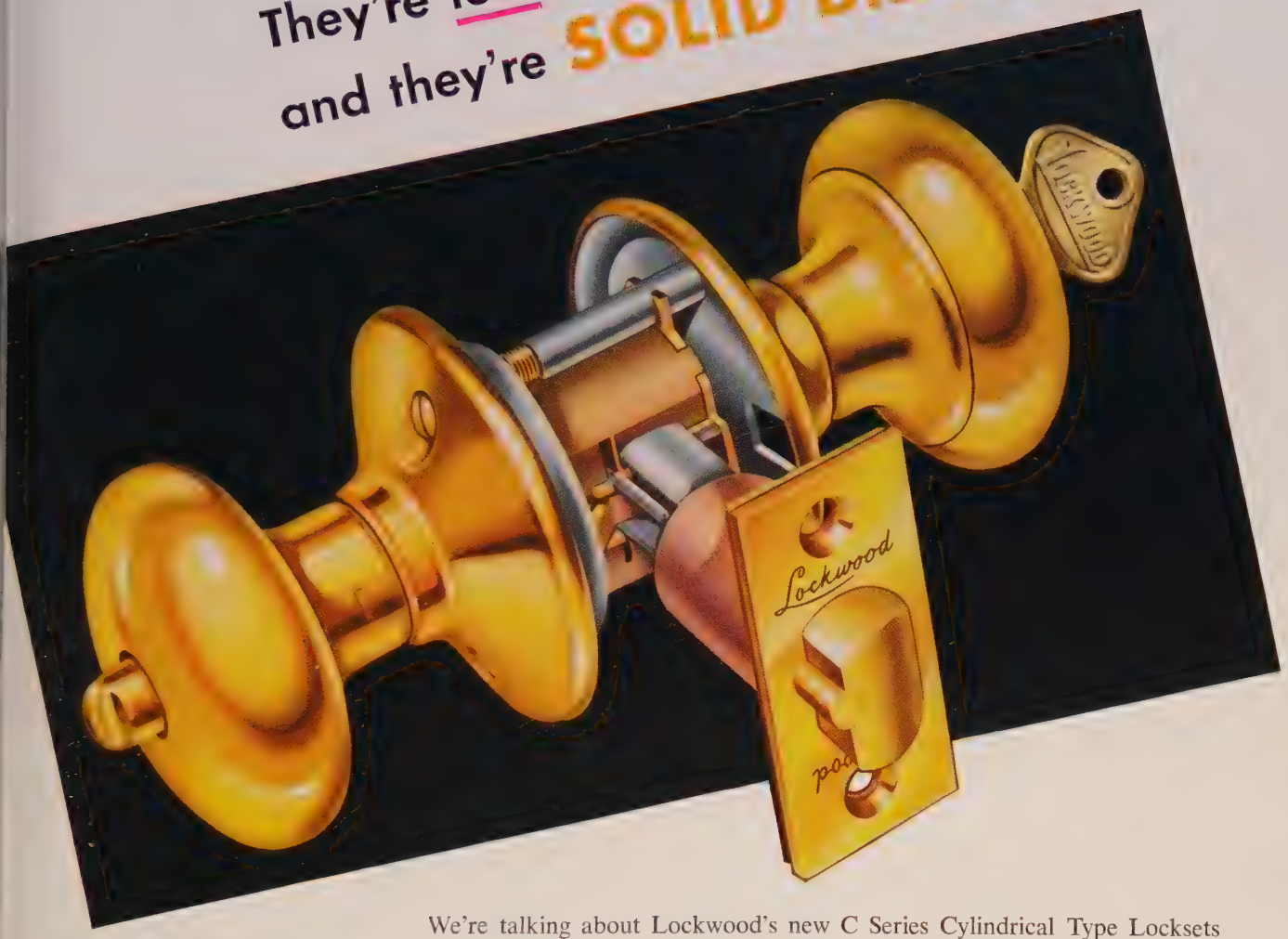
Virtually Perfect—X-ray tests, as well as photographs made at high magnification, show them to be virtually perfect crystals, he said. From the amount which they may be bent and still spring back, it is possible to measure the stresses to which they are subjected. This shows them to be far stronger than ordinary crystals, he added.

Dr. Hollomon said that work on defects in crystals is now assuming great importance both in the laboratory and the world at large. Metals, as used ordinarily, consist of crystals, and there are usually defects in the regular arrangement of the atoms of which they are built. If such defects can be eliminated, he added, theory indicates that metal strength might be increased as much as a thousand times.

Helical Growth—He also told of work in crystal growth, which has been found to take place in a helical direction, similar to that of a so-called "spiral" staircase. When a crystal forms, successive layers of atoms are built up. It turns out that a layer is ordinarily never entirely completed, but advances in a spiral, continually getting higher.

Materials used both in permanent magnets and electromagnets also involve defects, he stated. Such magnetic material consists of a great number of minute "domains." Each of these is a magnet,

They're new
They're high in quality
They're low in price
and they're SOLID BRASS



This new C Series Cylinder Type Lockset is made by Lockwood Hardware Mfg. Co., Fitchburg, Mass., Division of Independent Lock Company. Anaconda Metals in a variety of alloys were especially adapted to its "solid brass" construction.

We're talking about Lockwood's new C Series Cylindrical Type Locksets recently introduced to the trade. An entire new plant was built for their production.

Here, for the first time in Lockwood's history, ease-of-installation, ruggedness, smooth operation, outstanding design and long life were engineered into a lockset in one fell swoop, aimed specifically at the low-price field.

Time-tested brass is used in every wear-and-weather-vulnerable spot: turnbutton, knobs, knob shanks and inserts, roses, latchplate, auxiliary locking plunger — right down to the pins, springs, tumblers and extruded shell of the cylinder lock.

It took a bit of doing to determine the right Anaconda Copper Alloy, in just the right temper, gage and grain size for each of the several different functions and fabricating operations involved. But then, that's been the business of The American Brass Company for a long time. Maybe we can be of service to you? Address: The American Brass Company, General Offices, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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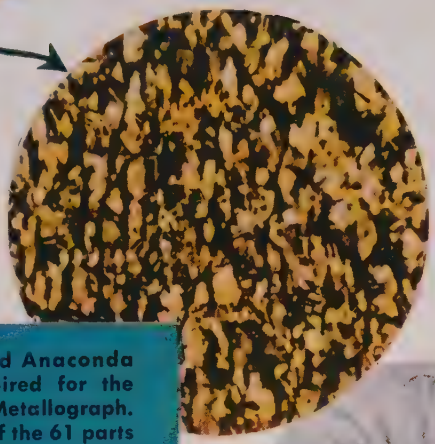
Made by The American Brass Company

To Bausch & Lomb:

may the second 100 years be as productive as the firs



HERE ARE TWO PICTURES OF THE SAME THING . . . above a section of Tobin Bronze* Rod. At right a micrograph at 75 diameters of a polished and etched specimen cut from the rod. *Reg. U. S. Pat. Off.

Seven closely-controlled Anaconda Copper Alloys are required for the Bausch & Lomb Research Metallograph. Shown below are a few of the 61 parts made of sheet, rod and tube.

To Bausch & Lomb Optical Co., which this year is celebrating its 100t anniversary of manufacturing fine optical instruments, America owes a deb of thanks. Through its development of scientific equipment, this pionee optical firm has helped American science and industry to apply modern pre cision methods to research and production.

One example of fine Bausch & Lomb industrial optical equipment is th B&L Research Metallograph. With this precision instrument a skilled labora tory technician may examine and photograph metal structure at high mag nification. To build it Bausch & Lomb uses 61 parts made of seven Anacond Copper Alloys. Eight parts are formed from tube, 16 from strip and 37 fron rod. Of what advantage are these alloys? They provide accurate, smoot surfaces on delicate working parts. They lead to production economie through higher machining speeds and longer tool life.

With such a variety of wrought forms available, there's little wonder tha so many instrument makers depend on copper alloys . . . from the mills o The Americn Brass Company. General Offices, Waterbury 20, Connecticu In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. 53

ANACONDA

COPPER · BRASS · BRONZE made by The American Brass Company

but they counteract each other. When the material is magnetized the boundaries between these domains, which are literally defects in the crystal arrangement, shift a little. Some domains get smaller while others get bigger, so that they predominate.

Dr. Hollomon expressed the view that further knowledge of this effect and its application may lead to far better magnetic materials than any now available.

Bugs to Iron

Iron and steel are very directly associated with a form of actual life—iron-depositing organisms which help to make some kinds of iron ore, according to American Iron and Steel Institute.

The best-known of the so-called iron bacteria and other organisms is the bacterium Leptothrix ochracea, which appears to be capable of self-nourishment on inorganic compounds. These microscopic "bugs" were busy in prehistoric times helping to form rich deposits of "bog" iron ore, or limonite, to be used by man millions of years later.

The leptothrix bacterium does not create iron, but "processes" it. Living in iron-containing water, it absorbs the iron from the water and deposits it as insoluble ferric hydroxide. This oxide forms an iridescent scum of ocher on the surface of water, often seen in wayside ditches. The oxide then sinks to the bottom, ultimately to form bog iron ore.

Foremen: Keep Them Informed

"Your supervisory group as a whole sets the tone of your corporate body," Carter C. Higgins, president of Worcester Pressed Steel Co., Worcester, Mass., told the national convention of Young Presidents Organization Inc. in Phoenix Ariz. Therefore, he urged, "build up your foremen!"

In outlining the process of training better formen, Mr. Higgins emphasized proper selection, proper training and constant efforts to keep the organization fit. He stressed good communication between management and supervisors to keep them well informed on company policy.

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- HEAVY DUTY, HI- TENSILE, HARD CHROME PLATED PISTON ROD.

Streamlined construction of the new T-J Cylinders *eliminates tie rods . . . reduces head size . . .* and *saves up to 40% in mounting space!* In addition, a new high in strength is achieved with solid steel heads and heavy wall seamless steel body . . . leakproof construction . . . extra high safety factor.

Cylinder walls are precision honed and hard chrome plated for long-life efficiency. Available with the new T-J Super Cushion Flexible Seals which insure positive cushion with automatic valve action for fast return stroke. Many standard sizes and styles . . . both cushioned and non-cushioned . . . for wide range of pushing, pulling, lifting, clamping or control jobs. T-J dependability. *Fast delivery* to meet rush requirements. Write for bulletin 8152. The Tomkins-Johnson Co., Jackson, Mich.

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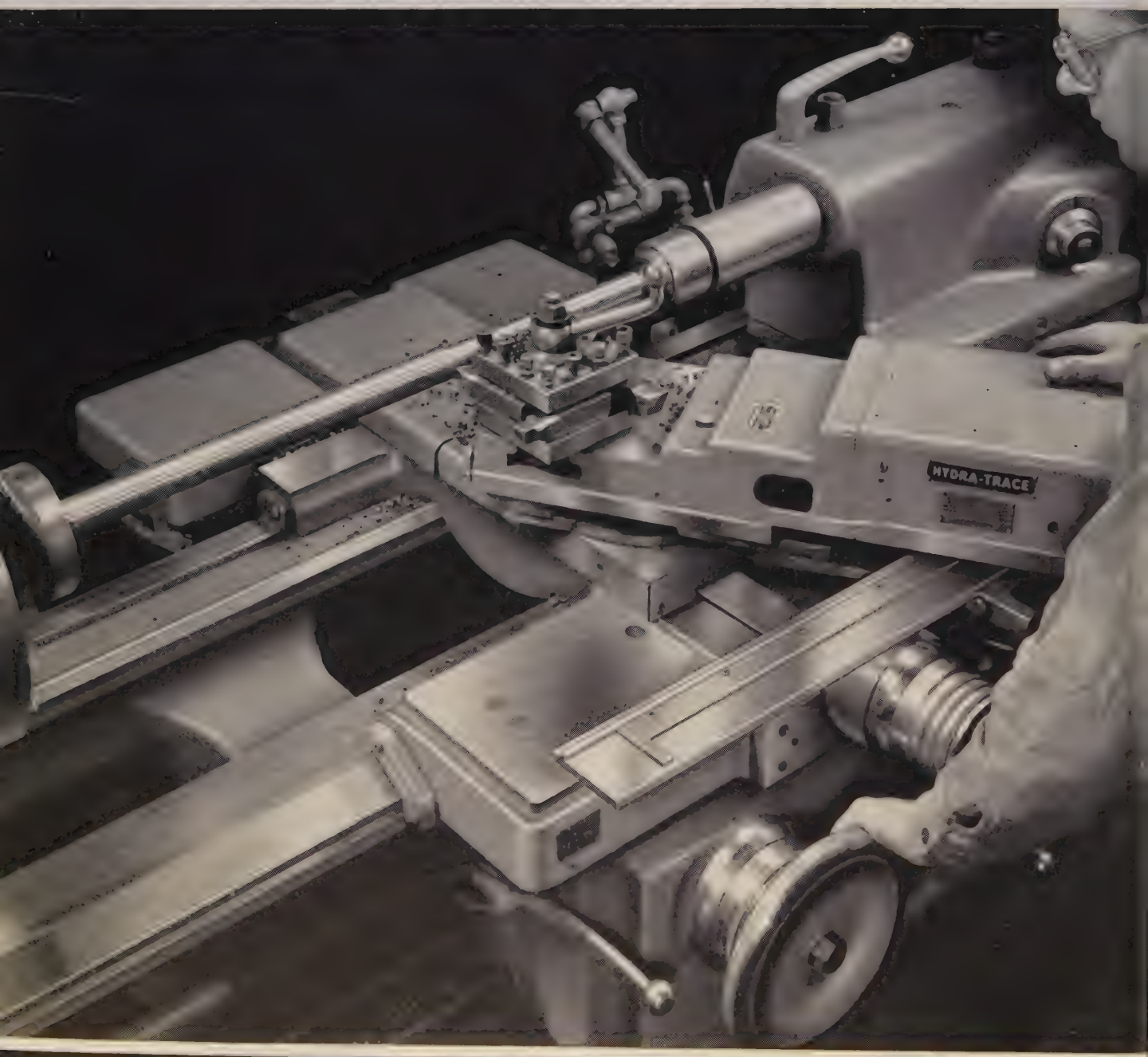

Hydra-Trace (Trade Mark, Registered U. S. Pat. Off.) is LeBlond's heavy-duty hydraulic tracing attachment can be mounted in place of the compound rest on practically all LeBlond Lathes built since 1935.

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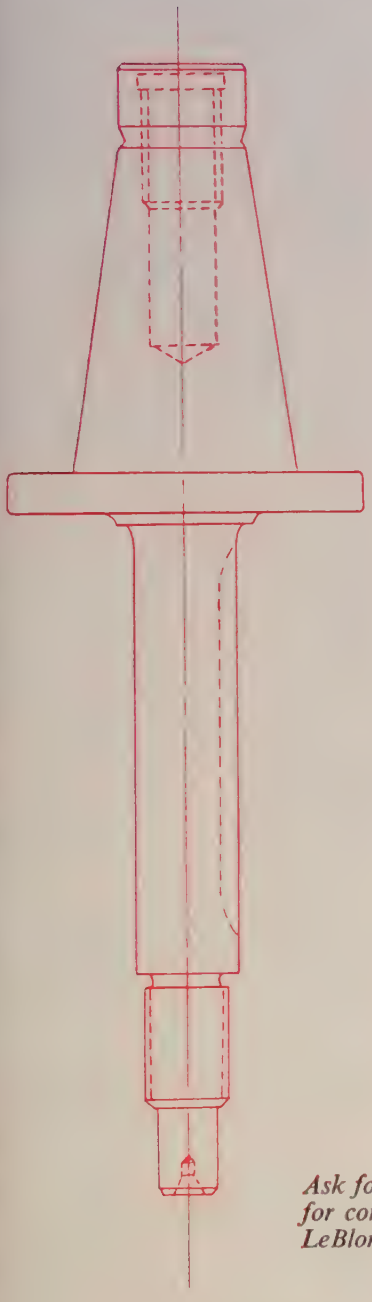
plus "Hydra-trace"



When defense needs mushroomed demand for production equipment, Scully-Jones & Co. of Chicago found itself jammed with orders for milling machine arbors (they make more arbors than anyone else). Acting on advice from engineers at LeBlond's Chicago Office, Scully-Jones added Hydra-Trace to their LeBlond 16" RT Engine Lathe. Now they turn out four arbors in the time formerly needed to produce three—same lathe, plus Hydra-Trace.

Besides boosting output, this template-controlled hydraulic tracer saves 45% on set-up time, gives uniform precision without the need of a highly-skilled operator.

Stepless form-turning, contour facing, and turning step shafts are all in a day's work for Hydra-Trace. *Fits all LeBlond Engine Lathes built since 1935*, can be mounted easily in a matter of minutes. Templates are flat, compact, suitable for both rough and finish turning. They can be produced readily in your own plant, stored in limited space.

When turning requirements call for increased output—with present machines or with new equipment—you'll find just what you need in LeBlond's complete line of lathes and lathe attachments.

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Ask for Bulletin HT2G for complete details on LeBlond Hydra-Trace.

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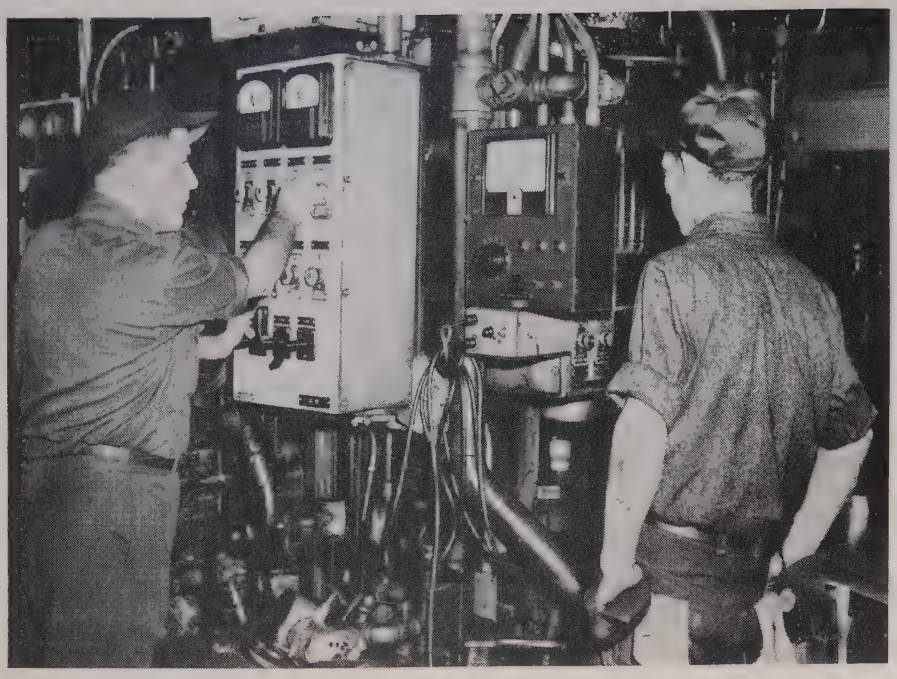


Visual strip thickness indication is shown on meter between roll operators, graduated to provide readings of as little as 0.000050-inch. Control units are designed so a section can be replaced promptly if circuit failure occurs

X-Ray Gaging Irons Out Strip Variables

By B. H. McGAR
Director of Metallurgy
Chase Brass & Copper Co. Inc.
Waterbury, Conn.

CONVENTIONAL practice in rolling copper alloy strip calls for spot-checking the strip with a hand micrometer and setting rolls by rule-of-thumb method based on the operator's experience. Although these methods are still practiced in many rolling operations, they are crude when compared with control available from electronic gaging.

Strip thickness variations as the product emerges from set, on the assumption of constant incoming strip condition, may be due to several process factors. Most fall into two general categories: Dimensional variations introduced by previous operations, and hardness variations. Either or both can be considered a coil-to-coil problem, or even a random variation in sections of single coil. Neither can be removed satisfactorily without automatic screw-down adjustment.

Chase rolls are used for a variety of alloys, tempers and hardnesses. Each of these basic copper alloy strip properties requires a special screw-down adjustment during setup.

Irregularities, Remedies — Dimensional variation stemming from mill component characteristics is caused by tensions created by takeup and payoff reels, roll temperature and between-stand tension in multistand operations. With no change in roll setting, a speed increase causes a decrease in gage; rolling speed decrease causes gage to increase. Care in design, selection and operation of equipment will minimize this problem, but it cannot be solved without incorporating compensating factors into mill operation.

End variation, most pronounced dimensional irregularity, persists to the finished product if not corrected in subsequent rolling. Here automatic thickness control is essential.

In common with other mechanical devices, mechanical contact gages sometimes employed to provide continuous thickness indication have limitations. Among these, rippling action of rapidly rolled strip makes contacts bounce so readings tend to indicate only high spots. In addition, the center of the strip cannot be measured and it is difficult to tie in continuous reading instruments with a gage or supervisory equipment.

Electronic Advantages — An x-ray gage can overcome these limitations. The type employed in Chase mills is made by Industrial Gages Corp., Englewood, N. J., where the original units were designed for the Cleveland mill several years ago. These original gages are still in use and since their installation the company has purchased a total of seven units. Performance records show no x-ray tube burnouts.

The gages operate on 155-v ac lines, contain a compact high-voltage source and x-ray tube, both safely shielded. Source unit is placed about 8 inches beneath the strip at a point within 2 feet from rolls. A small hole in the top allows the beam to pass upward through the moving strip. When the mill is not operating, this aperture is shielded automatically.

Off Limits — A pickup device mounted over the strip above the aperture converts x-ray energy into electrical energy. This is amplified and fed into a zero-center meter calibrated to indicate deviation from nominal gage. Maximum readings indicate variation of plus or minus one-tenth strip thickness. The scale is graduated so readings of as little as 0.000050-inch can be obtained on the thinnest strip rolled.

When variations from strip swing more than prescribed limits, the signal actuates circuits built into the gage that controls screw-down adjustment. These circuits compensate exactly for incoming strip thickness variations. Actuating signal also can be fed into a continuous stylus-type tape recorder to get a permanent strip rolling record.

Through use of strip samples of known thickness, equipment can be calibrated easily and quickly. Calibration is unaffected by rippling of sheets during fast passes.

FACED WITH A STEEL PROBLEM ?

One moment please . . .

Your steel problem is well on its way toward being solved the moment the Weirton switchboard operator makes your connection. Whether it's sales, metallurgy, production, shipping, or any combination, you have a direct line to fast action.

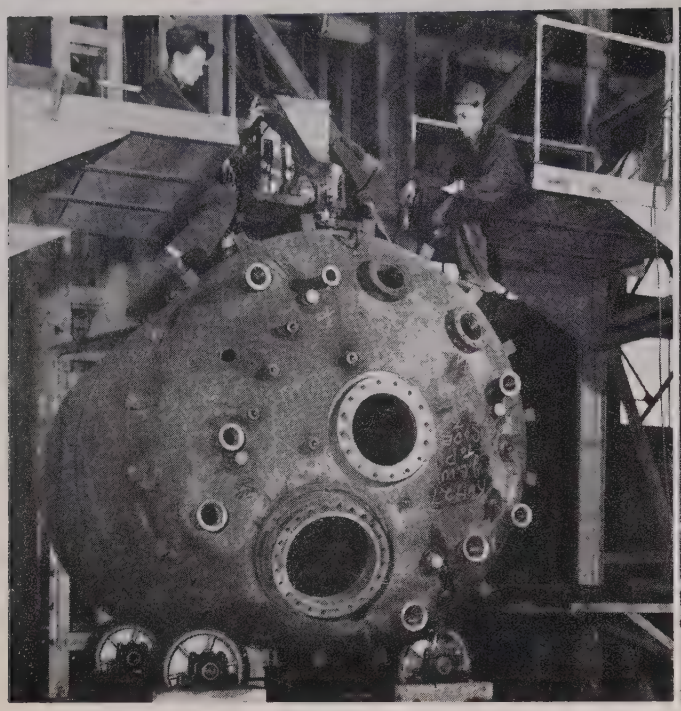
Fully realizing the importance of its customers' problems, Weirton has coordinated and centralized the key men in all phases of operations, under one roof. These men with the answers can get together on short notice and give you prompt attention. This unique integration assures you of quick answers when you need them to maintain production rates and meet schedules.

This method of operation was established for your benefit. When you are faced with a steel problem, pick up your phone and get all the answers . . . from Weirton.

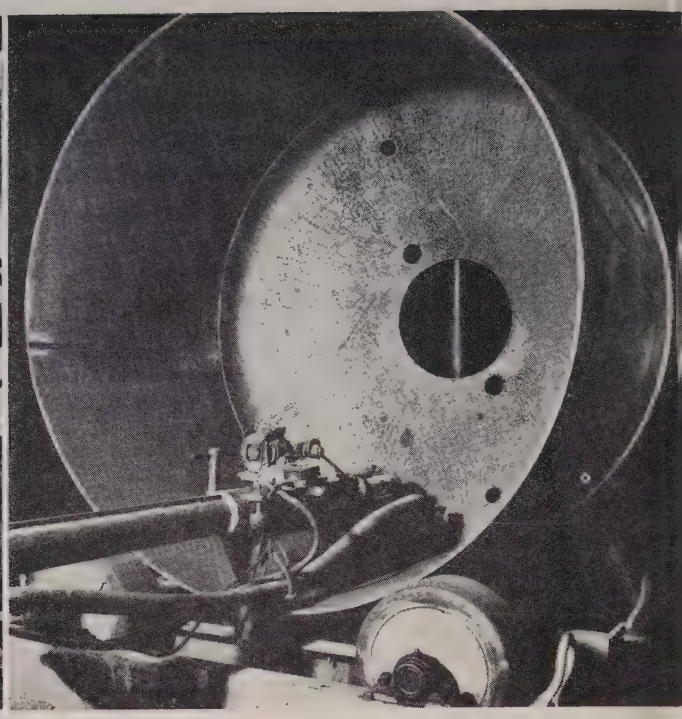
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



This fully automatic machine handled all of the circumferential welds until demand for tanks became too great. Operator and helper work from two adjustable scaffolds



Improvised machine consists of a Lincoln squirt welding head mounted on a tubular boom and provided with automatic flux feed. Weld guide pulley rolls along shell edge

Improvised Welder Meets a Crisis

When work got too much for one machine, they made a semi-automatic work automatically. It's only a temporary measure, but it's getting the job done

By RICHARD AVERY
Metallurgist
The Pfaudler Co.
Rochester, N. Y.

INCREASE in demand for fabricated steel tanks was handled at the Pfaudler Co., Rochester, N. Y., by augmenting their automatic boom-type welding machine with an improvised automatic machine. With the two machines, capacity is now sufficient to handle the stepped-up production.

The new machine is used chiefly for internal welds, leaving the other to produce external welds. The latter is better suited for this work because it includes adjustable scaffolds convenient for the operator and his helper. Getting the second machine into operation in the minimum of time was the problem from the outset.

Improvising Starts—As no fully automatic head was quickly available for the machine, it was provided with one of the "squirt" or semiautomatic types, made fully automatic by applying a continuous flux feed through a hose instead of using the hand filled cone feed supplied with the head. To support the head, a tubular boom is employed and is provided with a rack by which suitable longitudinal adjustment or overhang up to 8 feet can quickly be set.

This boom is mounted on a vertical slide, similarly adjustable, hence the electrode tip is quickly set in position and can be adjusted easily for constant arc gap. Electrode wire of ⅛-inch diameter is fed from a reel, mounted near the boom support, to the head mechanism and the flux feeding device is so arranged that feed starts just before the arc is struck and continues as long as welding proceeds. A vacuum pickup draws unfused flux back to a tank whence it is re-fed as required.

Excellent Weld Quality—Current of 410 amps is supplied by a standard Lincoln generator and at so high a density for the wire that excellent penetration results. A welding speed of about 12 inches per minute is attained on ⅜-inch mild steel.

On the boom just back of the head is a bracket carrying, on a vertical pivot, a small pulley that rides on the end face of the shell and helps to keep the electrode following the weld which is in a plane parallel to the end surface.

Application of the glass adhesive tape to the girth joint prevents subsequent loss of the weld metal, especially where the prior tack fitup was not too tight

This pulley also helps stabilize the boom.

Shell Turned — As in making other girth welds, the shell is turned by driven pulleys of a rotator and the hookup is such that motion starts as soon as the arc is struck and continues, at the speed set, as long as the arc is maintained. Although welding is automatic, an operator who stands or squats inside the shell, tends the machine, makes minor adjustments and sees that welding proceeds as required.

Welds with this setup are commonly those required to attach a dished head to the shell after the two have been positioned by hand tack welding. In general, edges at the joint are scarfed to provide a V-groove in which the weld is laid down. Fitups are as good as conditions permit, but gaps vary in width and, if too wide, molten metal drops through unless some expedient to prevent this leakage is employed.

Tape the Gap—One such expedient has been to apply a belt covered with flux and so arranged that the belt travels on and below the outer surface of the drums as the latter is rotated. This flux closes the gap but it is not easy to control flux feed and the procedure is somewhat cumbersome and unsatisfactory at times.

Recently, however, new forms of adhesive tape have been used to seal the joint outside, as shown in the picture. Such tape, made from glass fiber and, in some cases, coated with flux, has given promising results though it is still somewhat in the experimental stage.

Works Well—This tape can readily be applied to cylindrical surfaces or can be bent to fit into the V-groove, adhering to the beveled surfaces. Tape is less troublesome than flux belt, but it is necessary to maintain tighter fitups with the tape. Once an inside weld is laid down, of course, the joint prevents leakage of molten metal in the tank when the external weld is being laid down.

Use of the modified squirt welder has been of considerable help in meeting production schedules and is much faster, of course, than to do similar jobs by hand arc methods.

This setup has its limitations, however, and is considered as a temporary measure. As soon as conditions permit, it will be replaced by another setup similar to the original machine.

Inserts Mean Versatility

FORTY-SIX per cent reduction in grooving time in machining 41⅜-inch diameter by 27⅜-inch long cast steel cable drums was recorded recently when a midwestern manufacturer of heavy earth moving equipment switched from high-speed tools to 1⅜-inch diameter tungsten carbide insert tools.

This operation is performed on a 50-hp Cincinnati Hypro vertical boring mill and consists of cutting a 1 7/16-inch pitch groove, 5/16-inch deep at 13 to 15 rpm. When finished, the drum accommodates a 1¼-inch diameter wire rope.

Minimized Regrinding—Time required to groove one drum with special shape forged high-speed steel tools was 9.4 hours. It also necessitated 40 cuts of varying depths and three tool changes and resharpenings. With their use of Kennametal's Kennamatic cemented insert tools, one drum is grooved with 19 cuts and requires 5 hours operational time.

Three drums are machined with one cutting position to groove three more pieces. Since each end of the insert provides three new cutting edges, 18 drums are grooved before the tool is removed for regrinding. To resharpen the tool, only the insert's ends need be ground. There is no form or clearance to grind as was formerly required with high-speed steel tools. To groove 18 drums formerly would have required down-time for 54 tool changes.

No Tool Resetting—Kennametal's grade K2S 1⅜-inch diameter tungsten carbide inserts eliminate tool resetting and picking up the lead heretofore required with the other tools. Longer tool life and simplified tool maintenance provided by the inserts reduce machine down-time to a minimum.

Rare Earth Nodulizers

Metallurgical Enterprises, Buffalo, is offering data sheets that describe the functions and composition of two of its rare earths, N-I-Mix and REF. Both are balanced compositions containing fluoride to act as an efficient nodulizer in filling production requirements for nodular iron.

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CALENDAR
OF MEETINGS

May 18-19, National Fluid Power Association: Organization meeting, Bedford Springs hotel, Bedford Springs, Pa. Association address: 1618 Orrington Ave., Evanston, Ill. Temporary executive secretary: Barrett Rogers.

May 18-19, Association of Iron & Steel Engineers: Spring meeting, Hotel Statler, Buffalo, N. Y. Association address: 1010 Empire Bldg., Pittsburgh. Secretary: T. J. Ess.

May 18-20, Metal Treating Institute: Annual spring meeting, Hotel Shamrock, Houston. Institute address: 271 North Ave., New Rochelle, N. Y.

May 18-20, Industrial Furnace Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York.

May 18-22, Material Handling Conference and Exposition: Convention Hall, Philadelphia. Information: Banner & Greif, 250 W. 57th St., New York 19.

May 18-22, Conference, Cam Design and Tool Selection: Rochester Institute of Technology, Rochester, N. Y. Information: Robert D. Pease, associate director, RIT.

May 20-21, Detroit Chapter, Society Advancement of Management: Annual management clinic, Rackham Memorial Bldg., Detroit. Information: Jack E. Steinhelper, Kelvinator Corp., Detroit 32.

May 20-22, Gas Appliance Manufacturers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 60 E. 42nd St., New York 17. Secretary: H. Leigh Whitelaw.

May 20-22, Society for Experimental Stress Analysis: Spring meeting, Hotel Schroeder, Milwaukee. Society address: Box 168, Cambridge 39, Mass. Secretary-treasurer: W. M. Murray.

May 21-22, National Industrial Conference Board: General session and directors meeting, Waldorf-Astoria hotel, New York. Board address: 247 Park Ave., New York. Secretary: Clyde L. Rogers.

May 24-26, American Steel Warehouse Association: Annual meeting, Hotel Shoreham, Washington. Association address: 442 Terminal Tower, Cleveland. Secretary: Walter S. Doxsey.

May 24-27, Copper & Brass Research Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: B. B. Caddle.

May 24-27, National Association of Purchasing Agents: Annual meeting, Hotel Statler, Los Angeles. Association address: 11 Park Place, New York 7. Secretary: George L. Renard.

May 24-28, Scientific Apparatus Makers Association: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 20 N. Wacker Drive, Chicago 6. Executive vice-president: Kenneth B. Anderson.

May 24-28, National Industrial Service Association: Annual convention, Hotel Statler, New York. Association address: 818 Olive St., St. Louis 1. Executive secretary: Fred B. Whipperman.

May 25-27, Industrial Diamond Association of America Inc.: Annual meeting, Edgewater Beach hotel, Chicago. Association address: 124 E. 40th St., New York 16. Secretary: Athos D. Leveridge.

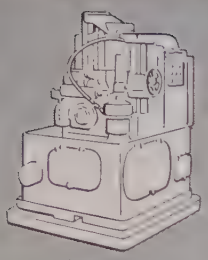
May 26-27, Electric Heating Committee and Michigan Section, AIEE: Conference, Detroit-Leland Hotel, Detroit. Institute address: 33 W. 39th St., New York 18. Information: W. C. Rudd.

May 26-29, American Leather Belting Association: Spring meeting, Skytop, Pa. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

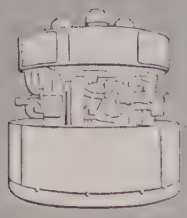
May 27-28, American Iron & Steel Institute: Annual meeting, Waldorf-Astoria hotel, New York. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

May 27-29, American Society for Quality Control: Annual meeting and exhibit, Conven-

(Continued on p. 116)



12-S HOBBER



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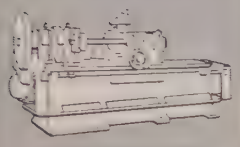
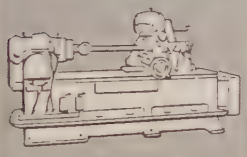


SH SPLINE HOBBER

MODEL 40 THREAD MILLER



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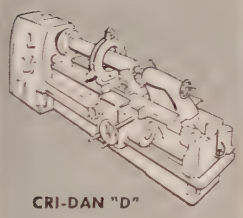
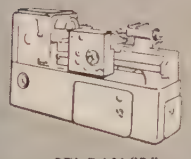


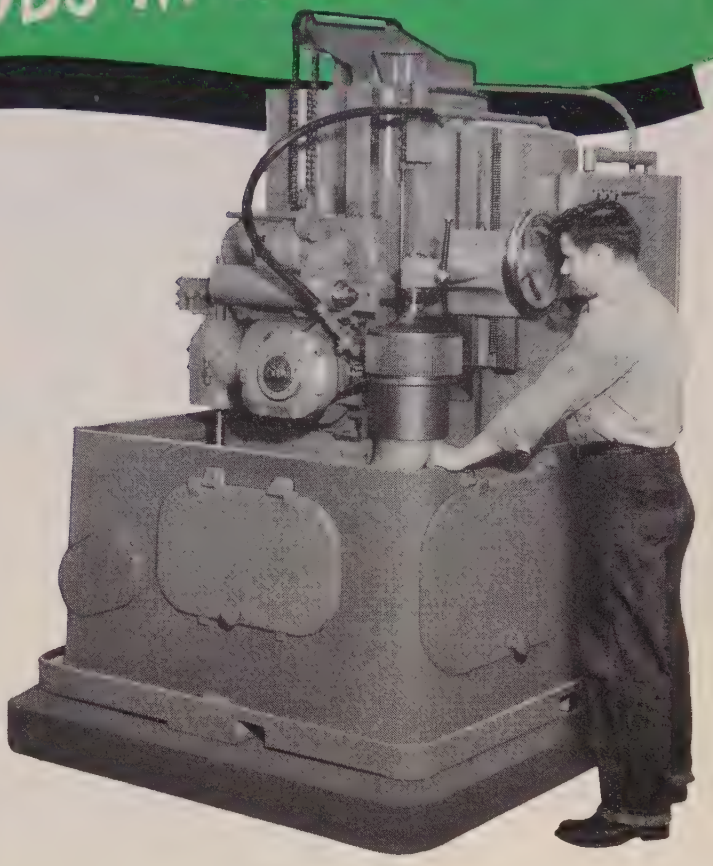
CRI-DAN "D"



CRI-DAN "B"

the Lees-Bradner Model 12-S (semi-automatic)

HOBS IN HIGH GEAR



Lees-Bradner Electric Hob Shifter also available on this model 12-S machine.

Reports from users indicate that the LEES-BRADNER Model 12-S Gear Hobber is truly a remarkable machine.

Since it is semi-automatic in operation, even relatively unskilled workers can run it efficiently. Once loaded, the operator merely pushes the start button. The Lees-Bradner In-Out mechanism feeds the hob into depth automatically and, at the end of the hobbing operation, backs the hob out and returns it to starting position.

This efficient machine can produce gears of remarkable accuracy—including right and left hand spur and helical gears up to 45 degrees.

Get in touch with the Lees-Bradner representative in your area or contact the factory direct for detailed information on this money-saving machine.

the LEES-BRADNER Company

CLEVELAND 11, OHIO, U.S.A.

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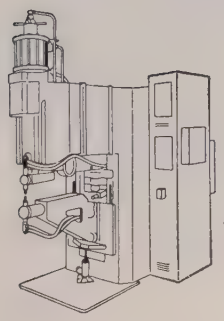
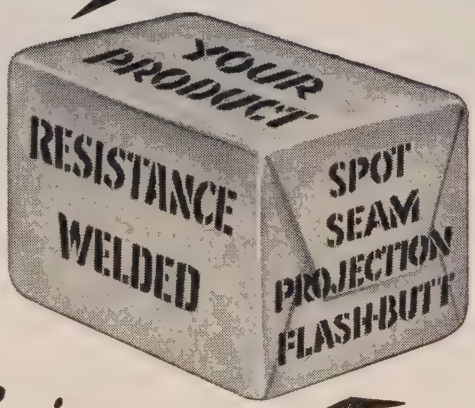


Application Engineers

T-W's Application Engineers work with you on properly applying resistance welding to your product. They give you specific answers and recommendations for your product and your production.

Design Engineers

The Design Engineers are specialists in creating welders specifically for your work. They take over when the Application Engineers have worked up the basic requirements with you.



Field Engineers

T-W has Field Engineers available in the areas near the cities listed here. They can give you on-the-spot, authentic answers to your questions. They will save you a lot of time. When you operate your welding equipment, they are on call to give you service.

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(*Continued from p.* 114)

tion Hall, Philadelphia. Society address: 70 E. 45th St., New York 17. Secretary: Edward B. Haden.

May 31-June 3, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Secretary. John C. Sears.

June 1-13, National Metal Trades Association: Plant management conference, Houghton Lake, Prudenville, Mich. Association address: 549 W. Randolph St., Chicago. Secretary: Louie W. Silvis.

June 7-12, Society of Automotive Engineers: Annual summer meeting, Hotels Ambassador and Ritz-Carlton, Atlantic City, N. J. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

June 8-9, Malleable Founders Society: Annual spring meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

June 9-12, National District Heating Association: Annual meeting, Hotel Lookout Mountain, Chattanooga, Tenn. Association address: 827 N. Euclid Ave., Pittsburgh 6. Secretary-treasurer: John F. Collins Jr.

June 14-19, National Association of Cost Accountants: Annual meeting, Hotel Statler, Los Angeles. Association address: 505 Park Ave., New York 22. Secretary: Arthur B. Gunnarson.

June 15-18, Radio-Television Manufacturers Association: Annual meeting, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 15-18, American Electroplaters' Society: Annual meeting, Benjamin Franklin hotel, Philadelphia. Society address: 445 Broad St., Newark, N. J. Secretary: D. Gordon Foulke.

June 15-19, Basic Materials Conference and Exposition: Grand Central Palace, New York. Information: Banner & Greif, New York 19.

June 15-19, American Institute of Electrical Engineers: Summer general meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

June 16-19, American Welding Society: National spring technical meeting & welding and allied industry exposition, Shamrock Hotel and Hall of Exhibits, Houston. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

June 22-25, National Industrial Advertisers Association: Annual meeting, William Penn hotel, Pittsburgh. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 28-30, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y. Secretary: E. A. Schoefer.

June 29-July 3, American Society for Testing Materials: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society address: 1916 Race St., Philadelphia. Secretary: Robert L. Painter.

Power Selector Published

Motor and generator reference booklet to assist in selecting motive power to handle most industrial applications is available from Allis-Chalmers Mfg. Co. The 50-page reference is reprinted from the 1952 edition of Lincoln's "Industrial-Commercial Electrical Reference."

Text and illustrations on integral horsepower motors and generators for the book were furnished by A-C in co-operation with Electrical Modernization Bureau Inc. Copies are available on request from the company, 1021 S. 70th St., Milwaukee.

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Then . . . back comes the Republic Field Metallurgist with recommendations that will give you the quality your product requires at the speed you need to show a profit.

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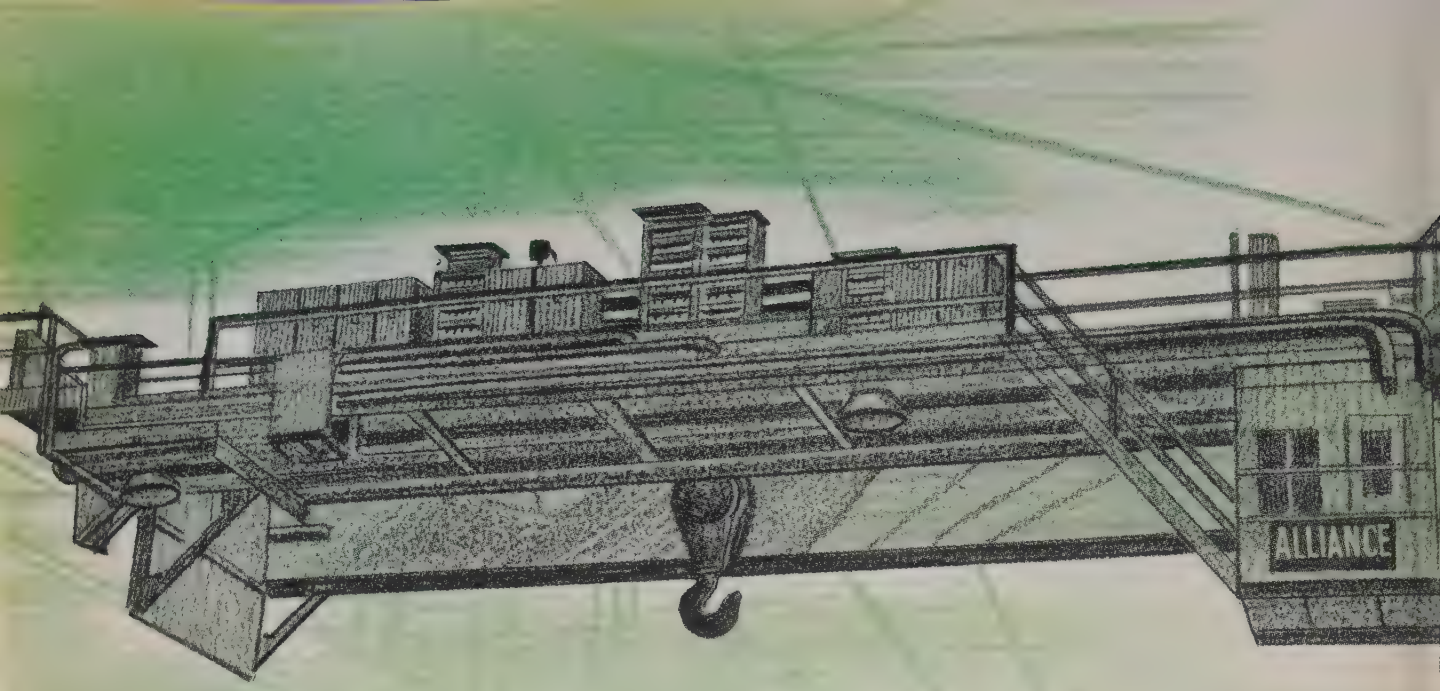

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Charging electric furnaces capable of 70-ton heats is no problem for this new Alliance Crane. Designed to handle special charging buckets and equipped with a 10-ton auxiliary hoist, this new Alliance Crane has a 60-ton capacity; a 60-ft. span and a high lift of approximately 60 ft. Equipped with a magnet, this crane loads buckets with scrap and trips load into furnace with ease and accuracy. Alliance Machine Company offers this new crane as an excellent example of how Alliance engineers collaborate with steel company engineers the world over to help them improve their heavy material handling problems. Contact Alliance, world's largest builders of the world's largest cranes for information concerning equipment best suited to your company's operation.

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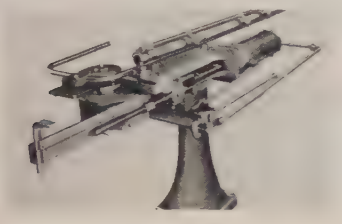
NEW PRODUCTS and equipment

Reply cards on page 123 will bring you more information on any new products and equipment in this issue

Improved Bending Machine

. . . completely automatic clamp

This air-powered bending machine automatically bends round tubing, light angles, channels and solid bars. Development of a completely automatic clamp and addition of needle bearings on the head mount allow smoother, faster performance. As many as 1000 bends



per hour are possible with 1⅛-inch OD, 16-gage steel tubing.

Called the Bend-Ex, the unit is adaptable for a variety of bending jobs by varying size of dies and jaws, which are quickly interchangeable. A total of 10 bends are possible on a single tube 10 feet long, ½ to 1¾ inches diameter. Paul Machine Tool & Die Works, Dept. ST, 46th to Kedzie, Chicago 32, Ill.

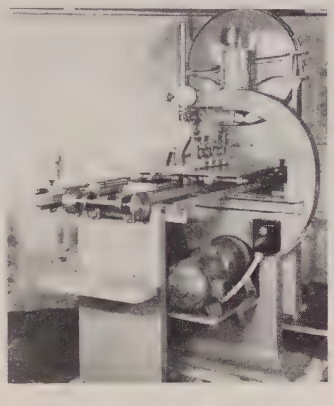
FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Casting Band Saw Setup

. . . checks wall uniformity

Special 26-inch band saw cuts automotive cylinder head castings to check uniformity of wall thickness in water jacket and inside coring uniformity. Cylinder head can be split vertically or cut through any section, in any location.

Machine is built around the manufacturer's standard 26-inch saw, but equipped with special slow-speed 1½-hp geared head motor to deliver correct output speed for sawing cast iron. It has steel table equipped with ball bearing rollers



that travel on fully-machined rails. The gravity feed mechanism is provided with handwheel and ratchet for rapid return.

Hydraulic cylinder not only regulates feed uniformity, but also prevents any jumping of table through voids in castings. Table is 30 x 30 inches; table travel, 31 inches. Moak Machine & Tool Co., Dept. ST, Port Huron, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Carbide Finishing Method

. . . uses abrasive paper belts

Abrasive belt machine, with abrasive paper belts, is designed to simplify the job of carbide tool sharpening, particularly where ini-

tial cost of diamond wheels is prohibitive or where skilled diamond wheel operators are unavailable. A two-step technique is employed: Rough grinding on a standard grit 60-silicon carbide wheel; and finishing sides and top of carbide tip on the belt machine using an abrasive belt from grit 60 to 150.

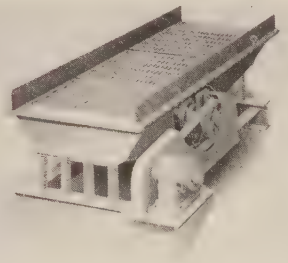
Model 454 was designed jointly by Minnesota Mining & Mfg. Co. and the manufacturer. Machine's calibrated tilting table swings out of the way for quick belt replacement without disturbing its angular setting. Other features are a tungsten carbide faced platen for accurate flat surface finishing, a 10-inch x 7½-inch work table with side supports for sharpening angular tools. Hammond Machinery Builders, Dept. ST, Kalamazoo, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Foundry Shakeout Line

. . . capacities to 5000 pounds

Line of foundry shakeouts is expanded by introduction of a medium duty unit in four sizes, with



capacities to 5000 pounds. Function of the units is fast separation of castings from flasks and molds, rapid reduction of sand lumps and reduced flask damage.

Provision is made for effectively limiting motion during acceleration and deceleration, thus eliminating hazard of destructive vibration during the critical speed range. Vibrating mechanism is full-floating

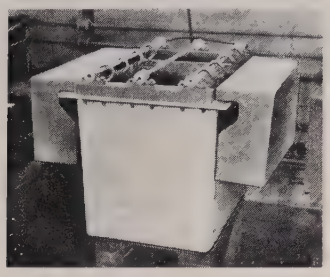
and completely enclosed. Amplitude of vibration is controlled by varying segmental weights. Link-Belt Co., Dept. ST, 307 N. Michigan Ave., Chicago 1, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Seamless Plating Tank

. . . impervious to chemicals

Seamless Fiberglas tank is designed for use with all solutions generally encountered in the plat-



ing field, with exception of caustic cleaner and hydrofluoric acid. According to the manufacturer, the tank offers protection against chemical attack equal to that obtained from lined steel units.

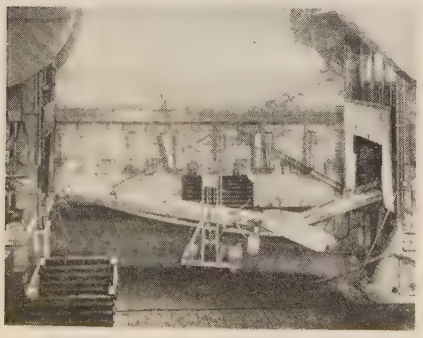
Temperatures of tank contents can be as high as 220° F. The tanks can be furnished in any required size, molded to exact specifications desired by the customer. Hanson-Van Winkle-Munning Co., Dept. ST, Matawan, N.J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Portable Adjustable Conveyor

. . . handles small parts, scrap

Jobs that require rapid handling of small mass-produced parts or disposal of machine scrap can be performed continuously by this portable adjustable conveyor, called



the Little Hustler. Of considerable importance is the conveyor's portability. Mounted on two swivel and two stationary casters, the unit can be moved readily when working layouts change and can be rolled away from presses to permit easy access for die change or maintenance.

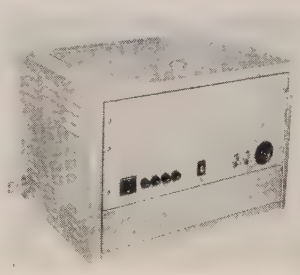
Adjustability is gained by a double-screw center lift that regulates working height through a 30-inch vertical range. Crank handle permits rapid pitch adjustment from horizontal to a maximum 45 degrees. Conveyors are available in 4 to 12-foot lengths with belts 12, 18 or 24 inches wide. May-Fran Engineering Inc., Dept. ST, 1725 Clarkstone Rd., Cleveland 12, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Lightweight Welding Machine

. . . precise arc voltage control

Lightweight sigma welding machine, the SWM-3, features arc voltage control to eliminate problems due to fluctuating arc. Electronic controls maintain proper balance of welding conditions by in-



stantaneously speeding up or slowing down welding wire feed rate as required by arc conditions.

Control unit does not get in the way of the welding operator or other work going on in the shop. In addition, it does not have to be moved with the welding machine from one job to another. Machine is flexible, fabricating most commercial metals in almost any joint design. Linde Air Products Co., division of Union Carbide & Carbon Corp., Dept. ST, 30 E. 42nd St., New York 17, N. Y

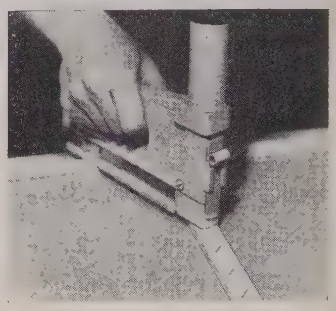
FOR MORE DATA—CIRCLE REPLY CARD NO. 7

High-Speed Air Tacker

. . . 200 staples per minute

Bumper-type trip on this fast-loading, air-driven tacker ups the unit's capacity to more than 200 staples driven per minute. This speed is the result of simplified direct drive. The bumper trip features an efficient cylinder principle to distribute 40 to 80-pound air pressures evenly for rapid operation.

Tacker loads a double bar of staples in a variety of metal and

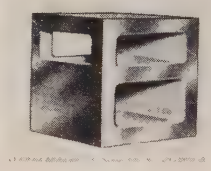


finishes from 5/32-inch to 13/16-inch. The spring-lock gate gives the operator easy access without use of tools. Heller Co., Dept. ST, 2153 Superior Ave., Cleveland 14, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Universal Box Angle

. . . three jobs—one tool

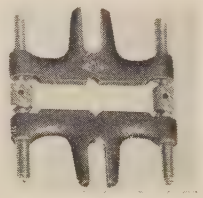


Versatile tool has advantages of universal right angle iron, box parallel and angle plate. It has clamping facilities of an angle iron; stability, balance and accuracy of a box parallel; and perpendicular flat surface of an angle plate. The Challenge universal box angle is made of high grade special analysis semi-steel, heat treated and precision ground. It is furnished in two sizes: 6 x 6 x 6 and 8 x 8 x 8 inches. Challenge Machinery Co., Dept. ST, Grand Haven, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Cutter Grinder Dog

. . . ready diameter adjustment



Versatility of this cutter grinder dog permits use in work that formerly required as many as four dogs. Readily adjusted to different diameters of work, the dog is perfectly balanced and built specifically for cutter grinders.

Two sizes are available: No. 100

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Whether you require stainless steel in bars — round, square, flat or hexagonal... billets... sheets... plates... wire . . . or angles, there is a form of Crucible REZISTAL stainless that will fill your specific needs. And Crucible REZISTAL stainless steel is available in a wide assortment of grades, gauges and finishes to meet the diversified requirements of all industries.

Crucible's staff of metallurgists and stainless fabricating specialists are well experienced in solving application problems in the chemical, food processing, dairy, textile, laundry, hospital, pulp and paper and a host of other fields — including uses for Crucible REZISTAL in household articles like cutlery, cooking utensils and the proverbial *kitchen sink*.

If you have a specialized application where the unique qualities of stainless will improve your product or your processing operations, don't hesitate to call in a Crucible representative who can give you the benefit of our broad experience. And when you buy stainless, be sure you specify Crucible REZISTAL, the quality brand of heat and corrosion resistant steels.

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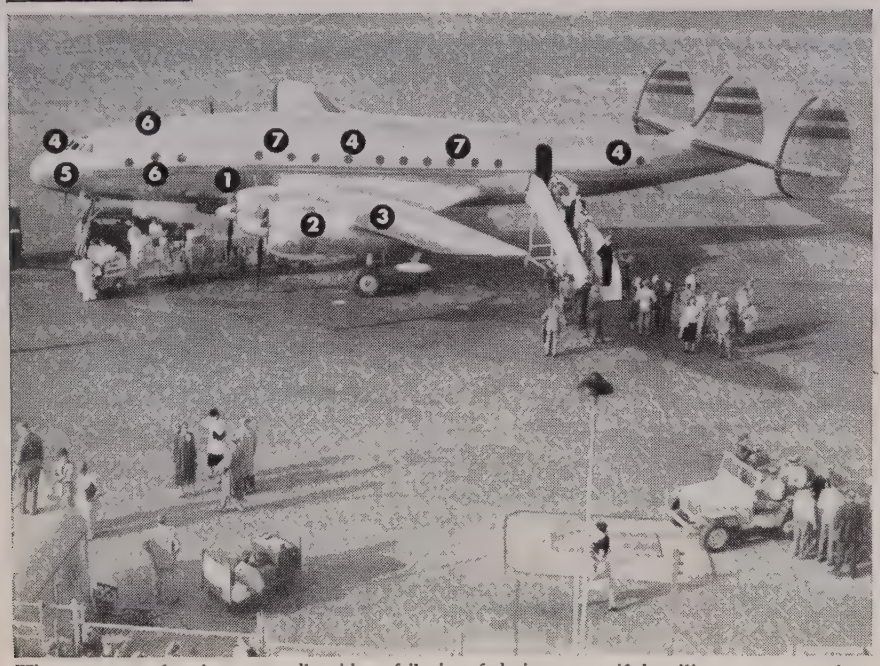


When parts must function repeatedly without fail, aircraft designers specify beryllium copper, a unique alloy with a multitude of desirable properties. This Lockheed Constellation serves to show where beryllium copper parts can be found in many modern airliners. For parts, see below.

VERSATILE BERYLLIUM COPPER

The aircraft industry makes wide use of this alloy's ability to do many jobs

In World War II, Berylco beryllium copper was drafted for the production war on many fronts. It did amazingly well. For aircraft, it improved such things as radar equipment, altimeters, valve guides, plug type connectors.

Today Berylco beryllium copper is an engineering material in wide demand—one of growing value to the aircraft industry. It is being used more and more for critical engine parts, from bushings to jet fuel pumps. Its use results in better airframe components as well as more accurate instruments. It helps solve increasingly tough radar and electronics problems.

In fact, nearly every industry today is aware of the part Berylco can play in making better, cheaper products. By offering the designer combinations of such desirable properties as elasticity, fatigue resistance, strength and conductivity, Berylco can often solve design problems involving conflicting requirements. And it can do so at low cost and with the utmost reliability.

The supply picture today is brighter than ever before. Now you can be certain of getting the material you need for *your* application. You can also, for the cost of a phone call, get the know-how and experience of the world's largest producer of beryllium copper. For full information, address your inquiry to THE BERYLLIUM CORPORATION, Dept. 3E, Reading 19, Pa.

Tomorrow's products are planned today—with Berylco beryllium copper

These Berylco parts—a few of those used in modern planes—are numbered to indicate where they appear in the large photograph. (1) Propeller bolts; (2) fuel injector; (3) de-icing stud; (4) instrument switch part; (5) instrument diaphragm; (6) connectors, plug-type and coaxial; (7) safety belt release.

Advertisement

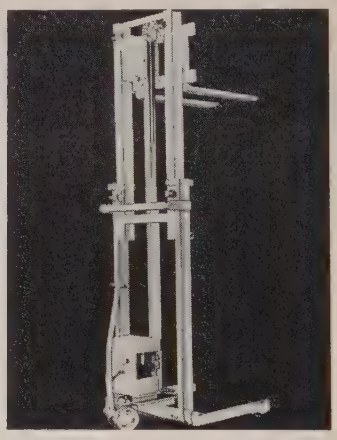
has capacity from ⅛ to 1½ inches; No. 99 accommodates work from ½ to 2½-inches. Ready Tool Co., Dept. ST, 554 Iranistan Ave., Bridgeport 5, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Telescopic Pallet Stacker

. . . used with electric trucks

This 2000-pound capacity telescopic pallet stacker with power elevation can be used with electric trucks and in many other applications. Its numerous uses include



warehousing jobs where products are stored and palletized in crowded areas.

Specifications show the unit handles pallets from 30 to 48 inches wide and up to 48 inches long. It is powered by ¾-hp 110-v 60-cycle ac power unit. Lowered height of forks is 3 inches; elevated height, 115 inches. Raymond Corp., Dept. ST, 91103 Madison St., Green, N. Y.

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Recording, Counting Computor

. . . charts random rates

Rate computer records random counting rates on a linear chart with constant computed statistical accuracy. A slidewire resistor is driven by a synchronous motor so

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69. Blackening Compounds

Swift Industrial Chemical Co.—Applications for three types of iron and steel blackening compounds are described in 4-page illustrated bulletin MBC 51. Compounds included are Nu-Black, Ultra-Black and Gamma-Black.

70. Carbon Steel Bar

La Salle Steel Co.—Characteristics of Stressproof cold-worked, furnace-treated carbon steel bar, including strength, wearability, machinability and minimum warpage, are detailed in this 12-page engineering booklet. Many parts made from it are illustrated.

71. Fastening Techniques

Milford Rivet & Machine Co.—"The Milford Method" is 12-page brochure which deals with scientific approach to products and parts assembly. It describes an integrated service of fastener research, design, application engineering and production collaboration which is offered by company.

72. Bulk Handling Equipment

Stephens-Adamson Mfg. Co.—Here is a recent issue of the S-A Conveyor (Volume 202) which describes and shows applications for a wide variety of bulk handling and storage units, including Swiveloader for yard storage, belt conveyors, elevators, bucket conveyors, car pullers, etc.

73. Small Machine Tools

South Bend Lathe Works—88 illustrated pages of descriptions and specifications of all South Bend lathes, shapers and drill presses comprise general catalog 5205. It also covers complete line of attachments, chucks, tools and accessories.

74. Industrial Photography

Praktica Co. — "Photography for Science and Industry" is title of 24-page illustrated brochure which outlines what photomicrography can do for you, and photography as applied to production, sales and advertising, maintenance and safety, record keeping and other uses. Types of equipment for taking, viewing, examining and reproducing photos are shown and described.

75. Spring Steels

Sandvik Steel, Inc.—Cold rolled spring steels are the subject of catalog 50, which in 32 pages gives an illustrated production and availability story which you'll find interesting reading. It also includes ordering information on a comprehensive products line, and gives useful conversion and comparative tables.

76. Tap Manual

Threadwell Tap & Die Co.—Latest information on tapping and Unified and American screw threads is contained in 56-page pocket size "Tap Manual." Tabulated dimensions, sizes, speed data, tolerances and flute information are featured along with other details too numerous to mention. Manual will be helpful in proper selection and use of taps of all makes.

77. Gear Materials

International Nickel Co.—20-page brochure "Modern Trends in Nickel Steel and Cast Iron Gear Materials" and 12-page article "Two New Gear Materials" are available pieces written for replacement gear purchasers and design and production engineers. Carburizing and direct hardening nickel alloy steels and low and medium silicon nickel gray cast irons are covered.

78. Turnings Crusher

Gruendler Crusher & Pulverizer Co.—Specifications, operational data and ordering information on line of metal turnings crushing machines are given in 4-page illustrated bulletin 1050. Capacities range from 1 to 18 tons per hour of finished graded product.

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79. V-Link Belting

Brammer Corp.—V-link belting advantages are discussed in data book 205, which includes a selection table with power correction factors, and assembly, installation and maintainance instructions.

80. Motors & Generators

Allis-Chalmers Mfg. Co.—54-page motor and generator reference book 51R7933 contains complete but brief outline of information that will assist the reader in the selection of motive power for most industrial applications. Fully illustrated and indexed, it contains many valuable charts and diagrams.

81. Cold Finished Steels

Pittsburgh Tool Steel Wire Co.—Pocket-sized catalog No. 6 of 48 pages includes much data on cold finished steels, drill rods and precision ground flat stock. Types and shapes available, applications and other information are included, along with recommended practices and data tables.

82. Expanded Metal Meshes

Penn Metal Co.—Specifications and applications for various types of Penmetal expanded metal are included in 24-page well-illustrated catalog 493 EM. Material is made in carbon steel, aluminum, stainless steel, Monel and Inconel, either standard or flattened. Fabrication data are also included.

83. Heating Corrosive Liquids

Submerged Combustion Co. of America—WHY submerged combustion, used for heating corrosive and other liquids, saves fuel and corrosion losses, WHAT is included in such an installation, HOW submerged combustion operates and WHERE it can be profitably applied is detailed in illustrated 6-page bulletin.

84. Fire Extinguishing

Stop-Fire, Inc.—A dry chemical extinguishing compound and its component nitrogen-pressurized container are described in bulletin SF-1001. Full description and illustrations are given on these products, which are recommended for oil, gasoline and all electrical fires.

85. Multi-Stage Pumps

Food Machinery & Chemical Corp., Peerless Pump Div.—Complete line of type TU multi-stage pumps is described in 12-page bulletin B-1400 with cross sectional views, parts lists, dimensional data, design details and application photos. Head range up to 1550 ft and deliveries up to 3000 gpm for 2, 3, 4 and 5-stage units. Pumps are designed for supplying circulating and booster water and process liquids.

86. Oils

Sun Oil Co. — Lubricating and quenching oils are subjects of 8 and 12-page bulletins A-2612 and A-2658. The lubricating oil is reported to be superior in heavily stressed applications, the quenching oil also to have many exclusive features. Background, application and composition data are given for both products.

EDITORIAL REPRINTS:

87. High-Speed Gaging

When hand gaging slowed down production, a screw-machine-product company added an automatic machine which gages faster than parts are machined. This Sigma automatic multidimensional inspection machine is described in STEEL reprint "High Speed Gaging Clears Bottleneck."

88. Induction Stirrer

Installation at Timken Roller Bearing Co. of 100-ton electric arc furnace equipped with Swedish induction stirrer has resulted in marked improvements in production and quality of steel. Description of this installation is presented in STEEL reprint "Induction Stirrer Improves Quality of Steel," by E. G. Malmlov and Q. Graham.

89. Auto Frame Assembly

STEEL reprint "Frame Assembly Cuts Shipping Costs" describes assembly system of passenger-car frames used at 11 Chevrolet assembly plants. Frames are bought in knock-down condition. Shipping costs are low because of space savings.

90. Carbide Blanking Dies

Developments are continuing to take place in the use of sintered tungsten carbide as material for blanking dies. Big block is lack of die designers and manufacturers who have the background for close-tolerance work. N. W. Oberg, Kennametal Inc. die engineer, discusses this problem in STEEL reprint "Long Life Promotes Carbide Blanking Dies."

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resistance in the circuit is proportional to time. With fixed battery voltage, the current which is recorded is proportional to the counting rate. Computer must be used with a scaling circuit adjusted for fixed count operation.

The instrument's range is controlled by the choice of scale factor and the speed with which the slidewire is driven. Resistance of

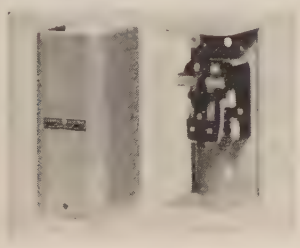
the circuit limits maximum current to the proper amount for driving the recorder to full scale. This limits recorder deflection to full scale value for all counting rates above the maximum for any given range. Research & Control Instruments Division, North American Philips Co. Inc., Dept. ST, 750 S. Fulton Ave., Mt. Vernon, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

General Purpose Relay Line

. . . operating life extended

Extended operating life through use of braided shunt and repositioning of shunt to reduce tension and wear are characteristics of this general-purpose relay line. Stand-



ardized open-form relays with conversion kits can be stocked separately and provide the units with

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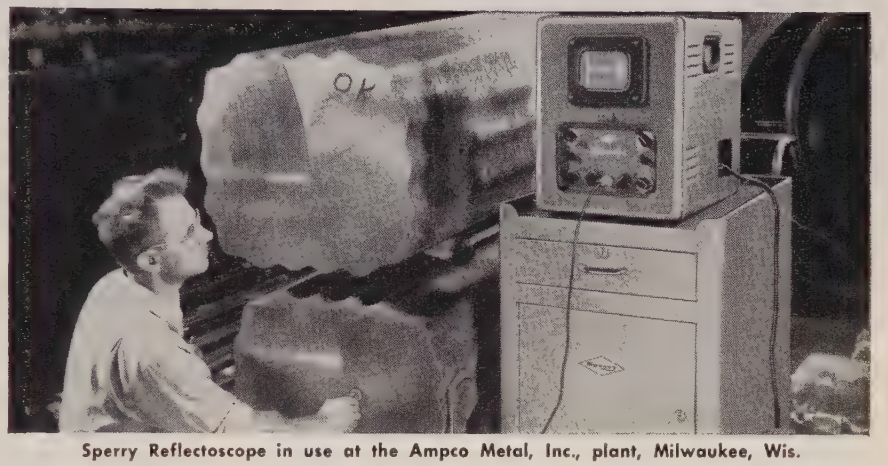

Sperry Reflectoscope in use at the Ampco Metal, Inc., plant, Milwaukee, Wis.

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Penetrating up to 30 feet in solid metal, Ultrasonic testing locates hidden internal defects not detectable by the most careful visual inspection. You'll find it's ideal for periodic machinery inspections without the need for time wasting disassembly . . . testing new shipments of raw materials . . . inspecting products during or after manufacture . . . and dozens of other applications where rigid Quality Control is important.

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TITLE _____
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CO. ADDRESS _____
CITY _____ ZONE _____ STATE _____

greater utility, reducing inventory.

Conversion kits are available for metal and compound base back-mounting, base receptacle and relay jack-plug applications, and explosion-proof enclosures. Relays are rated from 6 to 300 v; 60, 50 and 25 cycles; and 10 amp continuous contact. General Electric Co., Dept. ST, Schenectady 5, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Locating Microscope

. . . provides 30x magnification

Machine tool locating microscope provides 30x magnification, great enough to see 0.0001-inch. It attaches to any machine, such as a jig borer or a vertical milling machine, aiding the machinist in

checking contours, slots and surface conditions that cannot be approached by mechanical devices or indicators. Its field of view includes a full ¼-inch of the workpiece.

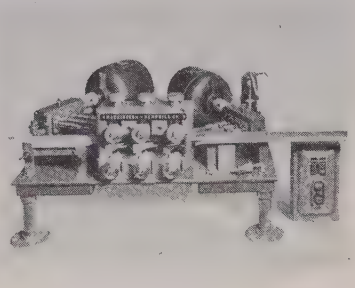
All table movements appear in their true direction when viewed through the eyepiece. A roof prism is incorporated into the optical system to erect the image. Perkin-Elmer Corp., Dept. ST, Norwalk, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Improved Rotary Straightener

. . . graphitic tool steel rolls

Improved model AYZ rotary straightener for small-diameter rod or tubing has its three sets of identically-contoured twin cross rolls now made of hardened graphitic tool steel. All six rolls are driven by floating drive spindles, square instead of circular in cross section. In addition to eliminating use of a key, the spindles, fitted into broached square holes of the uni-



versal joints, allow for lengthwise slip due to angularity of rolls.

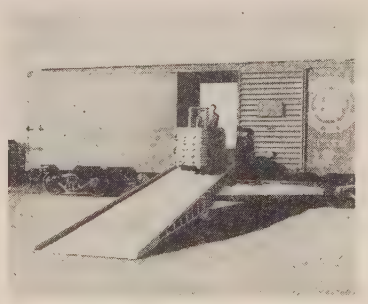
At its standard 70 fpm production speed, the straightener's six rolls are now actuated by two 3-phase 1/6-hp at 3600 rpm motors. Roll adjustment is refined by addition of camlobes as integral parts of the roll angling knobs. Mackintosh-Hemphill Co., Dept. ST, 901 Bingham St., Pittsburgh 3, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Portable Yard Ramp

. . . speeds ground-loading jobs

A frequent handling problem—that of loading and unloading freight cars from the ground—is overcome by this magnesium portable yard ramp. The ramp rolls easily on two wheels, enabling one-man handling. It is raised to car-floor by hydraulic lift. The model



is made in five standard sizes with capacities ranging from 6000 to 16,000 pounds. Magnesium Co. of America, Dept. ST, E. Chicago 19, Ind.

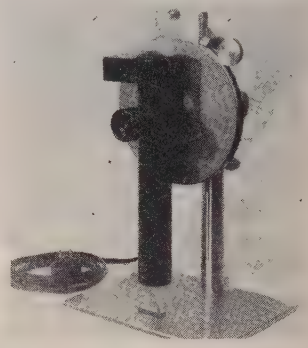
FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Angle-Checking Collimator

. . . sets to 30 seconds of arc

Angle setting and checking collimator sets or checks angles to 30 seconds of arc or, by transferring from a sine bar, to 5 to 15 seconds of arc. It provides a versatile tool for shops and inspection departments where budget restrictions prohibit consideration of a more elaborate instrument. It can be used for a wide variety of applications, such as measurement of external angle, tapers, cones and hidden surfaces.

Other uses are found in checking straightness of surface plates, machine beds, straight edges, etc., to fractions of a tenth per inch length. The collimator also can check cutting angle of lathes, millers, etc. on the machine because



of its self-setting feature. Mitchell Scientific, Dept. ST, 39 MacQuesten Parkway North, Mt. Vernon, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Soldering Iron Element

. . . speeds replacements

This terminal block can be removed from the soldering iron by depressing the terminal guard at the finger slots. It is not necessary to fish element lead wires around terminal. Steel spring guard reinforces terminal. Element is available in regular plug tip, hatchet, feather-weight and super-powered irons. Hexacon Electric Co., Dept. ST, 139 W. Clay Ave., Roselle Park, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

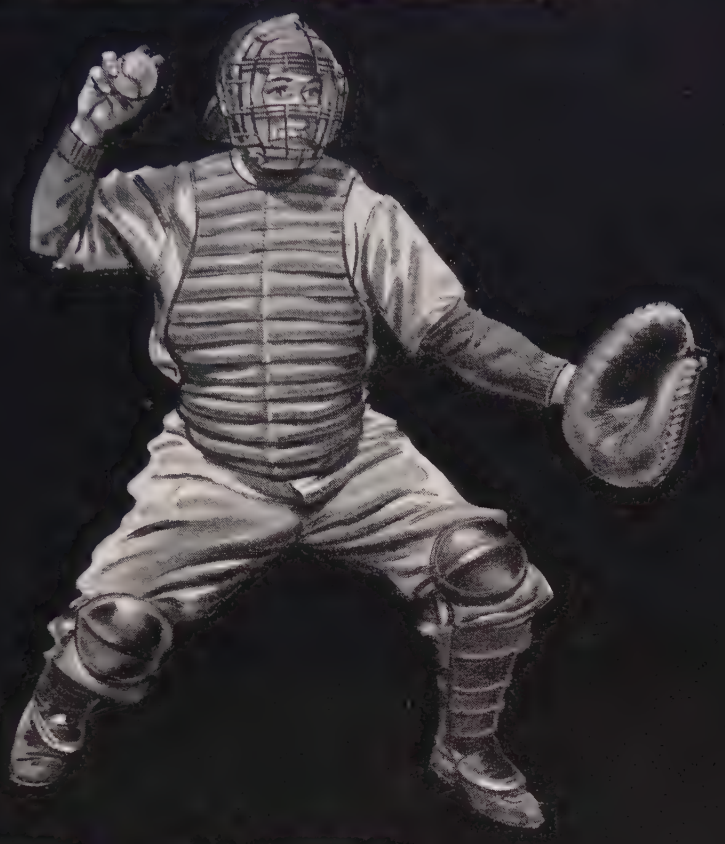
Versatile Power Nibbler

. . . cuts variety of shapes

This power nibbler with detachable crank case can also bead, fold, and cut straight or circular shapes. It cuts slots and louvers as well as irregular or freehand work by simple adjustments, with accessories provided as standard equipment.

Detachable crank case permits construction of frames for special purposes. Range of materials that can be cut includes 3/32-inch cold

Just as a catcher needs protection . . .



IRON and STEEL *Need* PROTECTION

If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing — the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania

The World's largest Job Galvanizing Plant

IN THE HEART OF THE STEEL INDUSTRY

galvanizing . . . pickling . . . painting . . . oiling

rolled steel; 5/64-inch stainless; 5/64-inch brass or copper. Largest circle the machine will cut is 28½ inches diameter; the smallest,

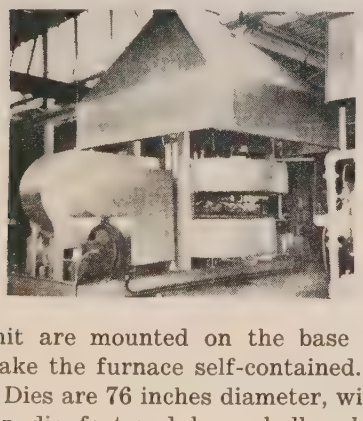
2-23/64-inch diameter. Folds to 5/64-inch and beading to 3/32-inch plate thickness are readily accomplished. Nord International Corp. Dept. ST, Box 44-N132, Denville, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Flattening, Tempering Furnace

. . . 350 to 1000°F range

This furnace, used to flatten and temper large, thin circular pieces, has 350 to 1000° F temperature range. A gas-fired recirculating type, its burner fires into a combustion chamber on the inlet side of the recirculating fan. Combustion blower and Vickers hydraulic



unit are mounted on the base to make the furnace self-contained.

Dies are 76 inches diameter, with top die fastened by a ball-socket joint to the bottom of the cylinder piston. In addition to tempering circular pieces, numerous other shapes can be placed between the dies as long as they are the same thickness. Waltz Furnace Co., Dept. ST, 1901 Symmes St., Cincinnati, O.

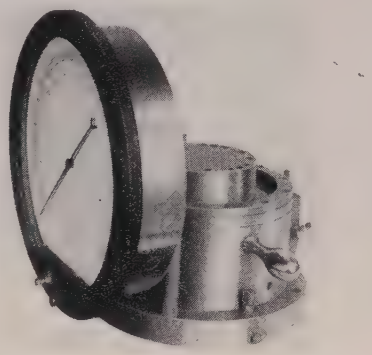
FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Hydraulic Weighing Units

. . . sizes to 50 tons

Line of self-contained, portable hydraulic weighing units, accurate to 0.1 per cent of scale, is stocked in sizes to 50 tons. The portable weighing systems permit laboratory-accurate force measurement anywhere in the plant and on the job.

Portable units are available in 24 ranges from 0 to 500 pounds through 0 to 100,000 pounds. Four load cell sizes provide choice of



8½, 12 and 16-inch indicators. A. H. Emery Co., Dept. ST, New Canaan, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Interlocking Connectors

. . . feature all rubber body

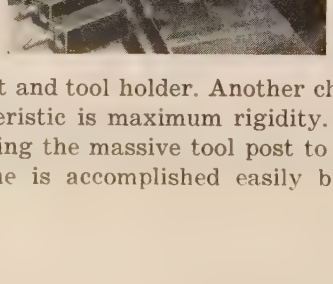
No. 2209 Turn-Tyte electrical connector has a locking device that makes it an all rubber model designed for heavy industrial use. Right angle lugs at the tips of female contacts engage and support male blades, thus establishing a strain-proof, double locked connection. Device has all rubber body. Rodale Mfg. Co. Inc., Dept. ST, Emmaus, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Tool Post and Tool Holder

. . . reduces setup time

Quick grip and quick release feature that enables cutting tools to be exchanged in minimum time is a chief asset of this master tool



post and tool holder. Another characteristic is maximum rigidity. Securing the massive tool post to the lathe is accomplished easily by a T block that fits into the lathe compound T slot or carriage.

Use of a number of tool holders makes bench setups possible for quick, easy insertion into the tool post when needed. It also gives an almost unlimited number of operations to one lathe setup. Bakewell Products, Dept. ST, 1128 Mission St., S. Pasadena, Calif.

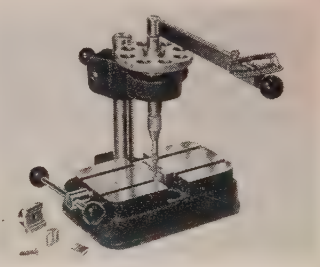
FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Torque Testing Fixture

. . . universal, simple design

Torque testing fixture has fully adjustable spindle set in instrument bearings, held in rigid alignment, to permit rapid engagement of driver with the work. Spindle has a female drive square to accommodate a wide selection of torque wrenches within capacity of each of two models.

A standard male drive square attachment is included with each fixture and is fitted to the driving end of the spindle. This permits



use of regular sockets, socket screw drivers, etc., without alteration. Two models in production have capacities of 0 to 200 inch-pounds and 0 to 150 foot-pounds. P. A. Sturtevant Co., Dept. ST, Addison, Ill.

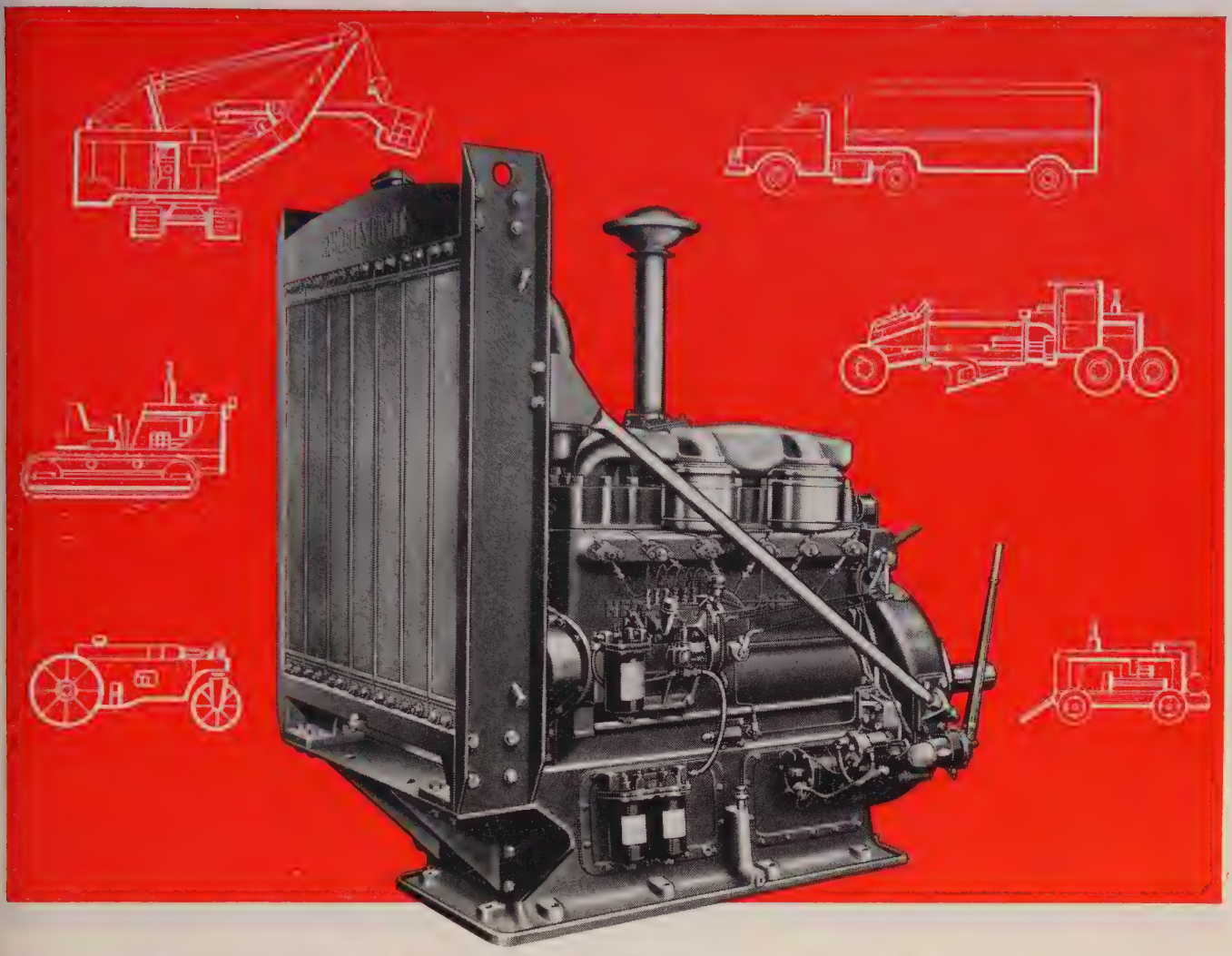
FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Small Centrifugal Pumps

. . . sealed in oil

A series of hermetically sealed in oil, small centrifugal pumps are for use in installations where a small low pressure, high volume pump is desired. Three sizes are available for handling 180, 350 and 475 gallons per hour and capable of 17½ foot lift. Pumps can be used either as immersion or horizontal types and can develop suction lift by use of a small foot valve. Samuel S. Gelber Co., Dept. ST, 162 N. Clinton St., Chicago 6, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25



Here's Why Hercules Motors Corp. uses *Summerill* Diesel Tubing

Quality-Controlled Summerill Diesel Tubing is formed, ready for use when it leaves our plant.

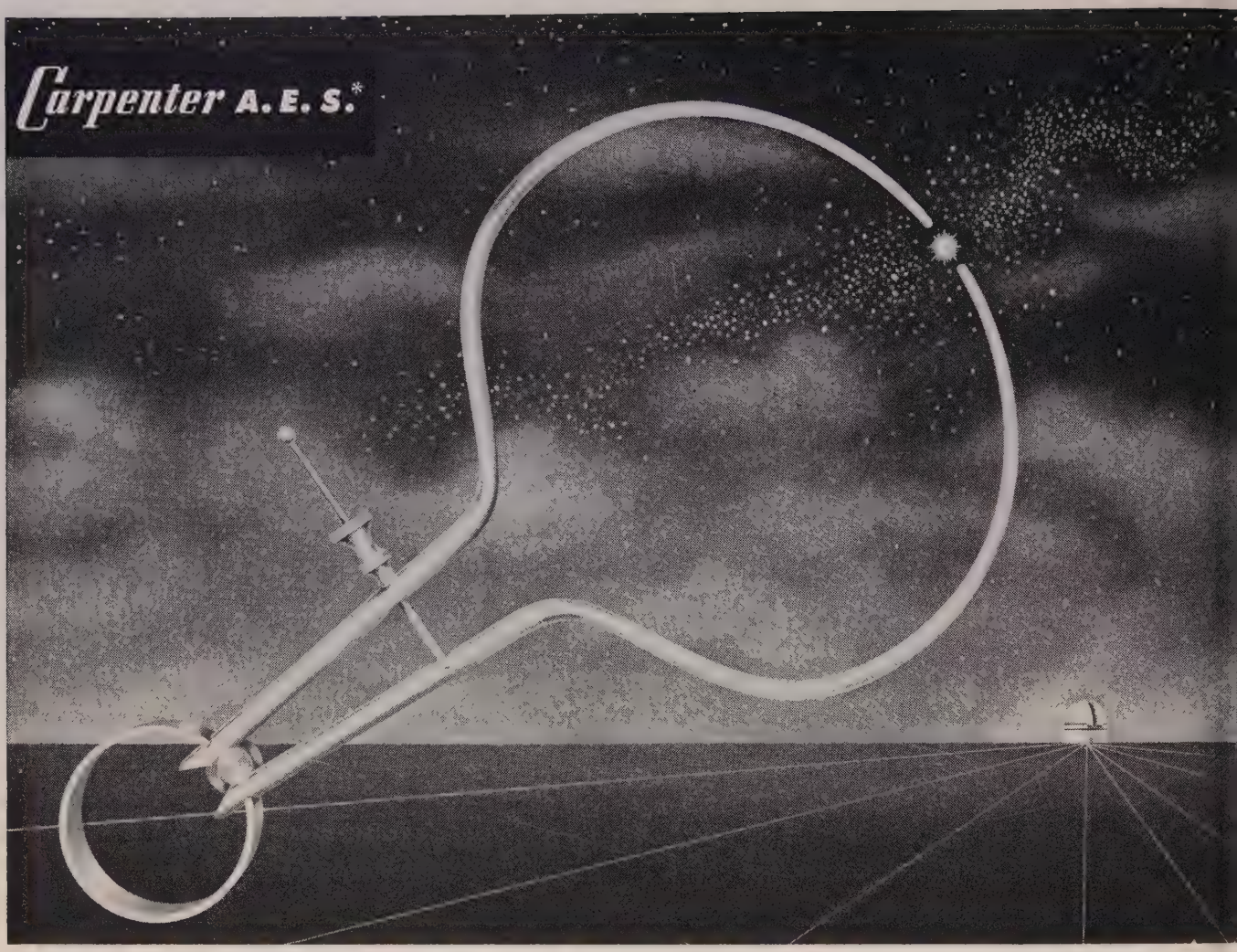
The Hercules Motors Corp., one of the nation's largest producers of diesel engines, uses Summerill Seamless Tubing *exclusively* for all high pressure lines because they know from experience that it always meets specifications and *never fails.* And you'll find that you can get the same excellent results in your product with Summerill.

For Summerill Diesel Tubing is a quality product at a competitive price. Only prime raw materials are used in its fabrication. Every tube is Quality-Controlled from raw material to finished product and subjected to painstaking inspection before shipment. The result? Each tube is free from radial cracks. In addition, Summerill Tubing has excellent bending and cold forming characteristics and consistently measures up to close-tolerance specifications. ● Why not drop us a line outlining your tubing problem? We'll gladly show you how Summerill Diesel, Hydraulic, Pressure, Mechanical, Aircraft or Specialty Tubing can help you reduce costs, eliminate fabrication difficulties and avoid on-the-job tubing failures. *Address Summerill Tubing Company Div., Columbia Steel & Shafting Company, Pittsburgh 30, Pa.*

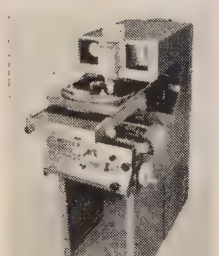
W&D 4656

IN COLD DRAWN SEAMLESS STEEL TUBING

SPECIFY *Summerill* AND BE SURE!



Finding a Faster Way to Measure a Star



*Another example of how Carpenter *Application Engineering Service is working for industry*

The giant 200-inch telescope at California's Mt. Palomar Observatory was picking up thousands of stars missed by other telescopes. But the job of measuring and coordinating the data revealed by the photographs was so big that astronomers couldn't keep abreast of it. Then the delicate astrophotometer was developed and the problem was solved. The new device *mechanically* computes the size of a star in a fraction of the time trained astronomers could do it with former devices.

Naturally, such a precise instrument posed quite a few materials problems. One was the type of steel for the hardened ways on which the machine travels horizontally back and forth. Many different special steels were tried. All failed because they couldn't meet the exacting straightness that was required.

Then, Carpenter **A**pplication **E**ngineering **S**ervice was called in . . . and Carpenter Vega, a new air-hardening steel that shows practically no distortion in heat treatment was put to work. Used successfully for thousands of critical tool and die applications, Vega has proved to be the only steel found to stay straight enough in the 20″ lengths of the ways. Are there applications in *your* plant where a steel providing this kind of performance could give your product extra competitive advantages?

Time and again, industry is finding new ways to save money and improve the salability of products with the help of Carpenter **A**pplication **E**ngineering **S**ervice . . . a service that uses *imagination* to apply steels for best results. A.E.S. is yours to profit by when you do business with Carpenter. THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.

Carpenter STEEL — **Tool, Alloy and Stainless Steels**

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

NINETY-FOOT CUT-TO-LENGTH LINE
. . . handles ⅛-inch steel in 15,000-pound coils

Versatile Leveler Shear Feeds Tailored Sheets

MAJOR equipment expansion program completed by Arthur C. Harvey Co., Boston, is providing New England purchasing agents an important source in their quest for steel and aluminum sheets.

Already operating is a 48-inch leveling and cut-to-length line capable of handling up to ⅛-inch steel in 15,000-pound coils. The 90-foot line turns out flat sheets cut to specification at any length from 4 to 16 feet, from customers' coils. Its versatility saves considerable scrap usually found in shearing standard size sheets—a factor important in moving coils to the warehouse equipment.

Illustrating the line's effectiveness, a fabricator estimated a $210 savings on a recent job involving $1300 worth of aluminum from buying sheets cut to his exact length from coil stock instead of having standard sheets sheared.

Operation, Control—The leveling and shear setup was built by Wean Equipment Corp., Cleveland, to handle coils from 14 through 48 inches wide. Two different sets of leveling rolls enable Harvey to produce sheets to special flatness tolerance, while the shear mechanism permits accurate length and squareness tolerance.

Operation begins with an uncoiler, from which coiled sheet is processed through a primary roller-leveler consisting of two pinch rolls and five leveling rolls. Drive rolls guide the continuous strip over a hump table that has a movable arch to absorb slack, as strip is halted momentarily at the shear.

As strip is fed automatically through the shear, it trips electric control switches that activate shear and hold-down mechanisms to produce an exact length. Cut sheets are then fed by conveyor belt to a second roller leveling unit which has two pinch rolls, 17 work rolls and 17 backing rolls. This roller-leveler flattens sheets 15 gage and lighter to stretcher-leveled standard; sheets over 15 gage, to commercial flatness. Run from there onto a piler bar, sheets are stacked and packed for shipment.

Additional Equipment—Two slitters, used for regular coil slitting or in conjunction with the cut-to-length line, round out the firm's expanded warehouse facilities. Slitting capacities on these latter two units also go to ⅛-inch thick steel and 48-inch wide coils with maximum coil weight limited to 15,000 pounds.

Advantages of flexibility are apparent. Large coils can be slit to narrow coils, made to wide, flat sheets or slit and made to narrower flat strips.

Cushion-Rubber Pad Draw

New 7000-ton machine incorporates Guerin and die-quench operations with basic draw

COMBINATION cushion and rubber pad process for deep drawing metal parts comes of age for commercial application with completion of a 7000-ton machine by Hydraulic Press Mfg. Co., Mt. Gilead, O. Called the Hidraw process, this drawing method was developed by Consolidated Vultee Aircraft Corp., Ft. Worth, Tex. The two firms worked together in designing the new unit.

To the basic drawing operation, HPM added features that incorporate the Guerin and die quenching operations. The drawing method, apart from the latter two functions, provides one advantage through perfect surface finish of the part due to its contact with rubber and male portion of the die only.

Early work with smaller setups also indicates uniform thickness and minimum stretching because the part is formed by fluid pressure, not subjected to an ironing operation.

Other characteristics indicate that parts difficult to form can be formed straight from the blank to the finished part. The rubber acts as a fluid pressure medium and there is no unsupported metal between the point of contact with the punch and the actual draw ring itself. Tooling is relatively inexpensive, especially where there are thousands of parts and small production lots. Another important factor: Hand labor in removing wrinkles encountered in the Guerin process is eliminated.

Fluid Pressure—Pressure generated in the rubber pad forces the blank down over the punch, where it assumes the punch contour. At the same time, the blank is clamped between rubber pad surface and blankholder ring, which prevents wrinkles from forming.

Pressure in the rubber pad cushion, which in turn controls forming pressure developed in the rubber pad, is adjustable to a preset stroke pattern as required by configuration of the part being drawn and the metal's tensile strength. Rubber pressures from

The right combination counts ... in grinding wheels too!

SIMONDS
ABRASIVE CO.
Grinding Wheels

Simonds grinding wheels have the right combination to put *you* in the 'chips' . . . the quality controlled combination of grain size and bond strength to stack up production . . . the sure combination for economical grinding, fast stock removal and long wheel life. Complete line includes everything for roughing, finishing, cutting off, polishing and sharpening. Whether *you* need grinding wheels, mounted wheels and points, segments or abrasive grain . . . you'll find Simonds your best deal for best results.

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Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co. Ltd., Arvida, Que.

4000 to as high as 10,000 psi have been employed.

When draw is completed, platen reverses automatically. Blankholder ring remains in down position until the pad has cleared the drawn part. Pullback pressure applied to the die cushion in the bed then ejects the drawn part from the punch. Automatic slowdown at that point is incorporated in the press control circuit to prevent deforming the drawn part until it has been freed from the punch.

Continuous Operation—To make its Hidraw presses production machines, HPM considered the necessity of continuous operation without downtime while changing tooling setups. They also recognized the need for a multipurpose machine, with features providing quick changeover from Guerin to Hidraw operation.

In working out these factors they designed two four-station tables, arranging them for assembly and dismantling Hidraw tools on the tables, with tables in out position. To eliminate moving large companion bolsters in and out of the press when the switchover is made tables are arranged to perform the Guerin operation directly on the table top with addition of a thin overlay plate to cover the pin hole pattern in the top of the work-loading tables.

Companion Bolster — It is also possible to perform high-pressure Guerin operations with the Hidraw pad by locating an auxiliary companion bolster properly at index points on the workloading table. Companion bolster rides in and out of the press and form blocks are loaded directly on top of the auxiliary companion bolster when forming parts at high pressure with the Hidraw pads.

With the HPM process, the only way blankholder pressure can be developed is by the rubber pad itself. Blankholder ring must cover the entire area of the rubber pad not in actual contact with the punch. Thus, it is necessary to have a cushion 90 per cent of the capacity of the main ram to permit forming parts down to 10 per cent of the pad holder area.

All-round versatility indicates a valuable metalforming addition. Of particular interest: Reported 50 per cent tool cost saving.

Every tiny bit of JESSOP steel is bigger than its job

There's a very simple reason for Jessop's fine reputation as a specialty steel maker. Jessop not only controls its formulae and processes with infinite care, it traditionally strives to produce better steel of each type than the end-use necessitates. Take, for example, the high-speed tool bits shown here. They cut harder materials faster and deeper than their basic analysis indicates, thus providing longer life and greater durability on normal jobs. Behind this tradition for extra quality is the keen desire for more business on the part of the Jessop producing and selling team. Every single Jessop man wants more satisfied customers. He wants them to be so enthusiastic they will forget there is anyone else in the world making special steels. Some customers already have.

HIGH SPEED STEELS · HIGH SPEED BITS · PRECISION GROUND FLAT STOCK · HIGH SPEED AND ALLOY SAW STEELS · HOT WORK DIE STEELS · COLD WORK DIE STEELS · CARBON AND ALLOY STEELS · GROUND AND TEMPERED PRODUCTS · STAINLESS AND HEAT RESISTING STEELS · STAINLESS-CLAD STEELS · CAST-TO-SHAPE STEELS · COMPOSITE TOOL STEELS · ARMOR PLATE

JESSOP

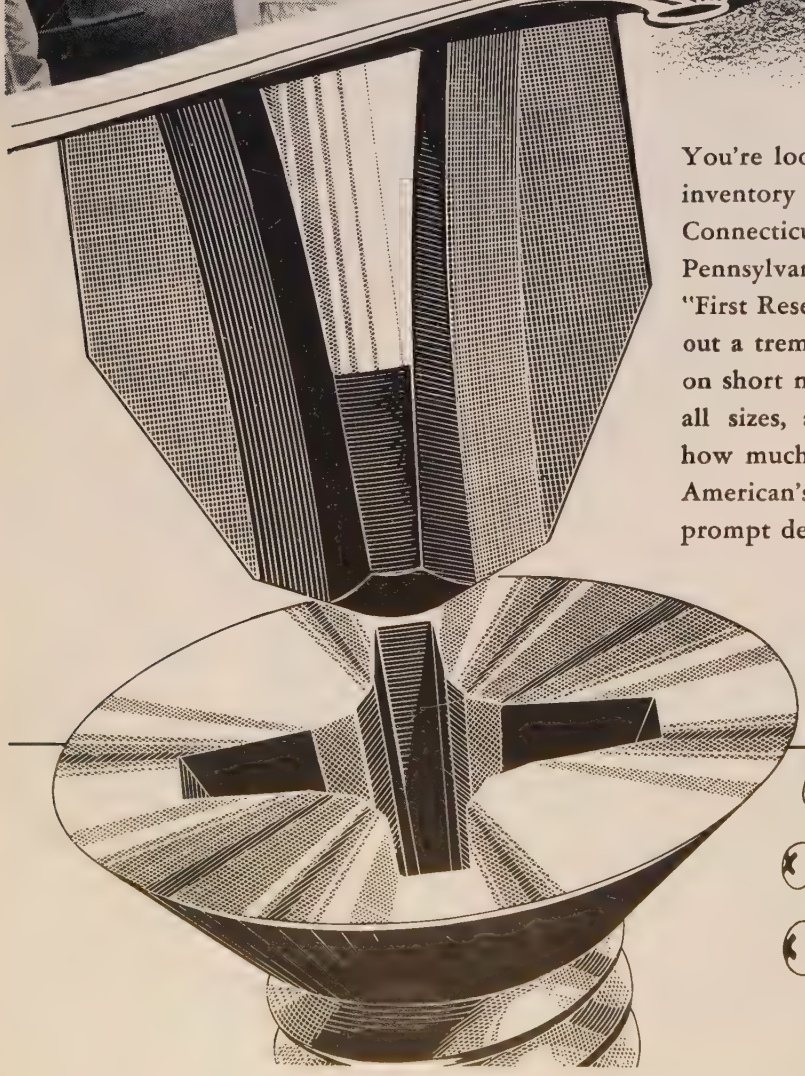
STEEL COMPANY · WASHINGTON, PA.

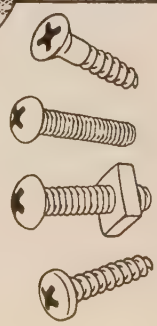
THE AMERICAN STORY

CHAPTER NINE

Biggest "Bank" of its Kind

You're looking at one section of the finished stock inventory in American's main plant in Willimantic, Connecticut. This, plus two other huge stocks, in Pennsylvania and Illinois, make American truly the "First Reserve Bank" for any user who needs to draw out a tremendous draft of Phillips or Slotted Screws on short notice. All types, all metals, all head styles, all sizes, all plated finishes . . . no matter what or how much you need, you have a "blank check" on American's unlimited reserves. Fill it in today, for prompt delivery *anywhere.*





AMERICAN SCREW COMPANY

PHILLIPS HEADquarters

WILLIMANTIC, CONNECTICUT

Main Office & Plant
Willimantic, Conn.
Office & Plant, Norristown, Pa.
Office & Warehouse, Chicago, Ill.

Steel Flooring Timesaver

Automatic weld setup, implemented by 10-foot aluminum tracks, pins down car floors

TIMESAVING application of automatic Unionmelt welding was illustrated in recent remodeling work on 200 gondola cars by Chicago, Burlington & Quincy Railroad at the Havelock, Nebr., shops.

The cars were equipped with nailable steel flooring held down by a $\frac{3}{8}$ x $1\frac{1}{4}$-inch bar running the length of the car on each side. Bars were fillet welded to the toe

WELDING HOLD-DOWN BAR
. . . speeds: 22 and 32 ipm

of the side-sill angle, then flooring was welded to the opposite side of the bar by a second fillet, also running the full car length.

Continuous Operation—Two type UE heads, mounted on Oxweld CM-37 machine carriages were used in each car, one for each side. Each machine rode on two 10-foot-long fabricated aluminum tracks that were leap-frogged so welding was continuous.

Welding speed for the $\frac{1}{4}$-inch fillet weld between bar and floor was 22 inches per minute at 400 amp, 26 to 28 v. For the weld between side sill and bar, speed was 32 inches per minute. Direct current was used in performing both operations.

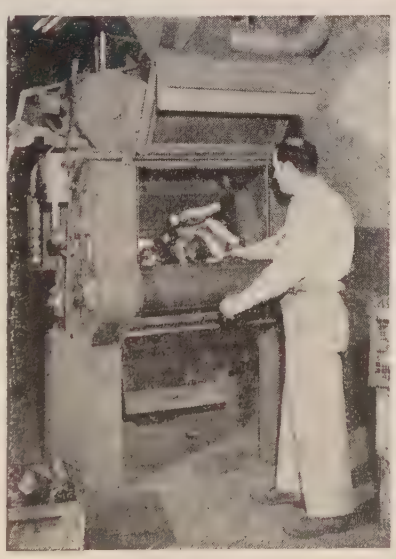
Welds were made with 3/16-inch No. 29 rod and grade 90 welding composition. All welded parts are low carbon steel.

B. H. Aircraft Co., Inc.
Farmingdale, N. Y.

SAVES 86% IN CLEANING TIME

Wheelabrator's fast thorough cleaning action scours metal surfaces brilliantly clean in but a few minutes — to save hours of cleaning time and cut costs to a minimum. That's the story at the B. H. Aircraft Company and everywhere else that Wheelabrator is used. Mr. Donald F. Baum, Vice-President, puts it this way:

"We are currently using the Wheelabrator for cleaning of all details prior to the spot welding and/or silver brazing of these details on our pipe assemblies. These details are made from .032 low carbon and .065 nickel-chrom-moly steel and range up to 4" x 4" in size. The average time for cleaning is about 14% of the time for sand blasting. Sub assembly bodies are now Wheelabrated in 70% of the time formerly required."



Installation of the above Wheelabrator Tumblast saved 86% in cleaning time on pipe assemblies.

See for yourself how this high speed blast cleaning can help you reduce your costs and improve the appearance of your products. Ask for a test demonstration without obligation. *Write today for details.*

American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka, Ind.

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

this name is important to YOU

...and so is THIS ONE!

MOST TRUCKS COME EQUIPPED

WITH *Mono-Cushions*

Why? Because most lift truck manufacturers realize that **Monarch Mono-Cushions** help users, like yourself, get more operating efficiency from their trucks. **Mono-Cushions** soak up fatiguing floor vibration . . . reduce peeling and skidding on take-offs and stops. Your drivers discover your trucks handle easier, respond quicker on **Mono-Cushions.** Remember! Most lift truck manufacturers select **Monarch Mono-Cushions** for the same reason you pick their trucks . . . dependability!

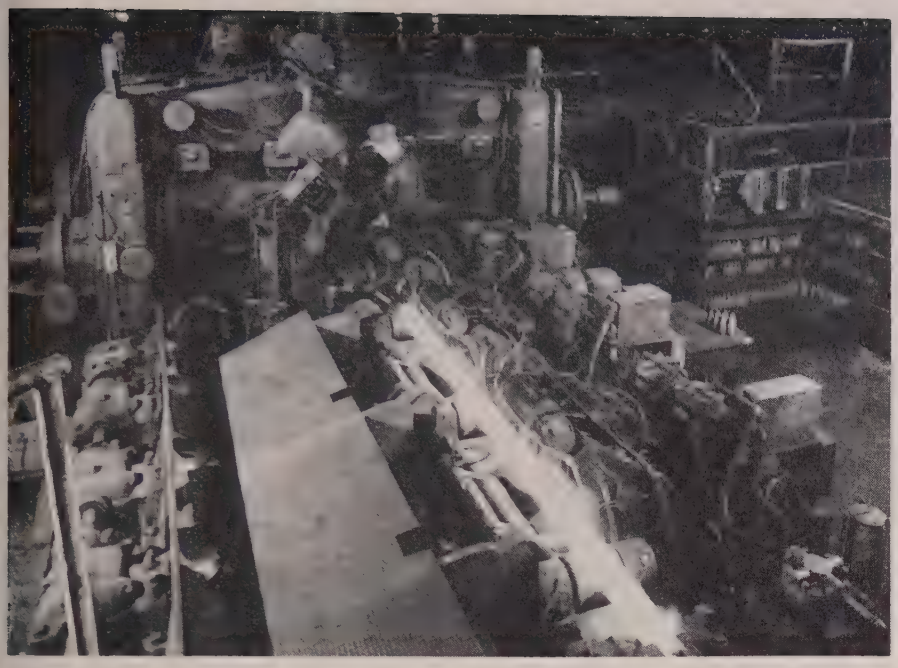
CALL YOUR TRUCK DISTRIBUTOR FOR Tire Replacements...

Follow the lead of your truck manufacturer and tire serviceman. Re-equip them with ***Monarchs*** *. . . the king of the truck tires. Monarchs are easier on drivers, trucks and floors. Don't waste your lift truck's efficiency. Have your truck serviceman put Monarchs back on them again!*

THE MONARCH RUBBER COMPANY

550 LINCOLN PARK · HARTVILLE, OHIO

SPECIALISTS IN INDUSTRIAL SOLID TIRES AND MOLDED MECHANICAL RUBBER GOODS



Guide to Precision Piercing

Series of three roller guides on this outlet table installed by Steel & Tube Division, Timken Roller Bearing Co., Canton, O., holds mandrel bar and pierced tubing accurately for precision piercing. Roller guides, made of the company's Graph-Mo steel, resist nicking and pitting and are self-polishing. Compressed air valve located on each guide is electric current-actuated, timer controlled

Open-Hearth Furnace Campaign Improved

Basic brick, bonded roofs, refractory gun and checker blowing lower maintenance at British open-hearth shop. Box-type roof gives good results on German furnaces

USE of basic brick with added protection from a 3-inch splay of front pillars to reduce mechanical wear, and extensive water cooling were means of reducing maintenance repair on the front lining of open-hearth furnaces to one complete renewal during one campaign at the East Moors Works, Guest Keen Baldwins Iron & Steel Co. Ltd., Cardiff, Wales. This was announced by S. G. Williams in speaking on "Hot Metal Practice" at a recent joint meeting of the Iron and Steel Institute's Engineers Group and the Plant Engineering and Steelmaking Divisions of the British Iron and Steel Research Association, London.

Other factors which contributed to campaign life at this open-hearth shop were:

1. Bonded instead of ringed roofs which took one shift longer to install but reduced patching and practically eliminated collapses.

2. Basic bricks at furnace ports, front and back linings, wing and sidewalls and uptakes to charging floor level. Possible heat loss through 9-inch uptake linings determined a return to 14-inch thickness thus affording a continuous record of the air and waste gas temperature.

3. A gun used for maintenance inside the furnace.

4. Checker blowing, which appeared to result in loss of air preheat temperature taking 24 to 48 hours to regain, but which made it possible to raise the bearer arches by 1 foot, thus speeding up the removal of flue dust on rebuilding.

No Top Repairs—Except in extreme necessity top repairs are not carried out. There are two categories of general repair. The first included roof, linings and walls, uptakes, pulling slag and top courses of checker work which took seven days from fuel off to lighting warming gas pipes. The second was similar but added complete checkers. This took nine days from fuel off to lighting warming gas pipes.

Roofs are dropped by crane, and the charger knocks in the front-wall. The debris is thrown on to the valve house floor (on tilting furnaces through the slag notches) whence it is removed by tractor shovels and wagons or dumper cars for removal and sorting.

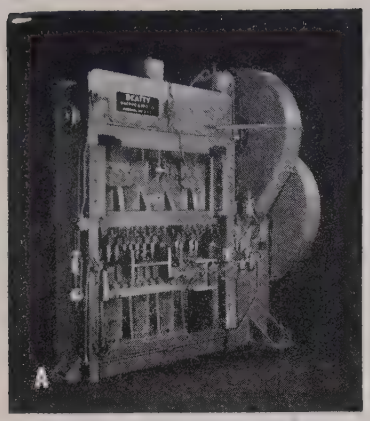
Slag and debris from the slag pockets are removed by tractor shovels, for the access of which the slag pockets had been enlarged. Similarly, regenerator wickets had been enlarged to allow the jib of a mobile crane to enter with buckets for removing the old bricks and with a pallet for rebuilding.

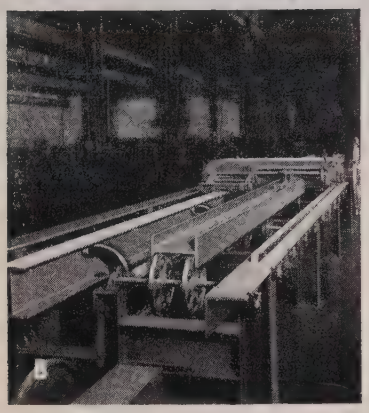
Cardox explosives are used for breaking up large lumps of slag, and a method using sand floor and walls plus stopper sleeves has been adopted for easier placing of the charges.

Handled on Pallets—All bricks are unloaded on pallets in the valve house and taken by fork lift trucks to the appropriate storage bay, whence they are removed by the same means to positions beneath the hatches in the charging floor and conveyed by crane to the site. Palletized roof bricks are positioned on stands set in front of the furnace or on the main cross girders of the furnace superstructure. Lining bricks are moved by roller conveyors into the furnace. Apart from advantages of service to the bricklayers, palletizing substantially reduces breakages and chipping. In a further effort to decrease downtime, a brick elevator is used for conveying bricks speedily from valve house floor to positions unattainable by fork trucks, such as regenerator chamber arches. It is also used for delivery of bricks to a furnace through slag notches.

In initial warming up with coke oven or blast furnace gas pipes, the roof temperature is raised to 400° C within 12 hours. Liquid fuel is then introduced and the furnace gradually warmed to top heat 24 hours later. Pipes on to commencement of first charge is 40 hours.

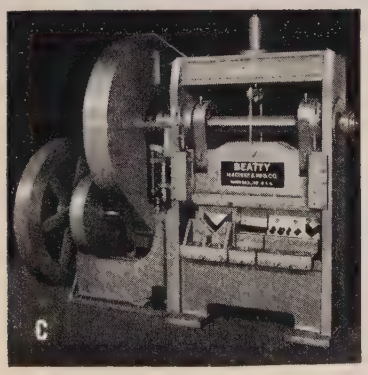
Removal of slag is facilitated at the Corby works of Stewarts & Lloyds Ltd., by building ramps in



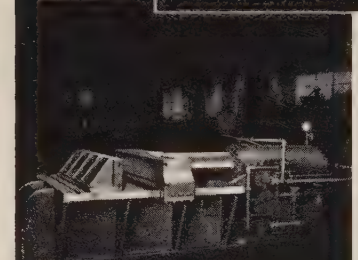


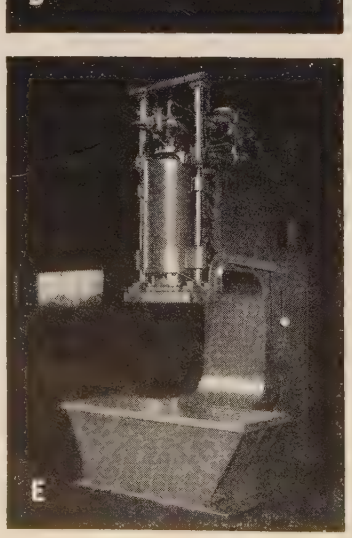
TAKE YOUR PICK

When playing the "ole shell game" you always guess wrong. That's not true when you pick a BEATTY machine for your plant. If one of the machines illustrated isn't the answer to your production problem, BEATTY engineers will design and build one to fit your specific needs. Broad experience in varied fields of metal working industries enables us to build machines that satisfy the demands of any fabricator.



BEATTY
MACHINE & MFG. CO.
HAMMOND • INDIANA





A. BEATTY Guillotine Beam Punch. Punches webs and flanges in "I" beams from 6 to 30 inches.

B. BEATTY Spacing Table handles web and flange punching without roll adjustment.

C. BEATTY Guillotine Bar Shear for "short order" shearing of bars, rounds, angles and squares.

D. BEATTY Horizontal Hydraulic Bulldozer for heavy forming, flanging and bending.

E. BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

the slag pocket covered with 2-inch bars and insulated with old bricks and sand. A 30-foot by 10-inch square bloom inserted across a fulcrum facilitates prying and removing the slag, so that the pockets are cleaned in about 12 hours. Basic ends afford a more friable slag. Checkers 13½ x 6 x 3 (10½-inch flues) provide at least 18 months service and easy cleaning.

Failure in regeneration and slag pocket arches is minimized by the use of 40/42 Al_2O_3 firebrick.

Reports Long Roof Life—All-basic furnaces and those with supported or suspended roofs now account for 30 per cent of the total number of open hearths operated in Western Germany, according to Dr. Ing. A. Mund, Krefeld, Germany. Extraordinarily long roof life is being achieved. In one large coke oven gas furnace with additional oil firing, the roof lasted approximately 1750 heats, in which the furnace produced 192,000 tons of steel. The roof of a 35-ton coke oven gas furnace reached a life of 4000 heats.

The so-called box type of roof construction is giving good results, Dr. Mund stated. In this design single courses between the lateral ribs are subdivided by the insertion of longitudinal ribs into any desired number of boxes. This provides a further bracing of the whole roof and enables any single prematurely worn places to be secured by filling the affected boxes with filler bricks.

Air Condition Manual Revised

A newly revised edition of their air conditioning manual has been published by The Trane Co., La Crosse, Wis. manufacturers of heating, air conditioning and heat exchange equipment.

A new fan chapter has been added to the book to cover fan application and selection, basic fan laws and duct design data and nomenclature.

The present 380 page edition marks the 16th printing and second major revision since 1938. Since that time the manual has, according to the publisher, not only been popular with engineers and contractors, but has also been used as a standard text and source reference on air conditioning.

RECLAIMING CONCRETE AND BARS
. . . old 211-ton structure was moved as a unit

Crane Transfer Job Salvages Ladle Lining Pit

SECOND-HAND concrete salvaging project turned in by Kaiser Engineers Division recently provided a small but worthwhile $8000 savings, plus some eye-filling crane transfer work. The operation was completed during the $65 million expansion program underway at Kaiser Steel Corp.'s Fontana, Calif., plant.

Opportunity to reclaim the concrete came when a ninth open hearth was projected for the steel company's existing battery of eight furnaces.

The program called for plans to extend the open hearth building, abandon a big concrete ladle lining pit and build another pit at a second location within the building.

Feasible to Salvage — With a 250-ton overhead crane already available, the idea of salvaging the old pit was feasible. A check of original designs indicated the pit contained 211 tons of concrete and steel reinforcing bars—104 cu yd of concrete and 3½ tons of rebars.

The division performed the transfer task by driving four holes in the old pit's sides to admit rigging cables, then lifted the structure out as a unit ready for its new location. The building extension and crane trackway had to be completed before the pit could be spotted in its relocated position.

Positioned, Leveled — As their final step, the engineers excavated the new hole and placed seven steel billets set to grade. Then they lowered the pit into position and shimmed it until level. Low forms were constructed around the ladle pit and a foundation gouted in.

Machine Burnishes Axles

AUTOMATIC machine burnishing was adopted recently for finishing car wheel axle journals in the Glenwood shops of the Baltimore and Ohio Railroad, Pittsburgh. For this purpose a heavy-duty end-drive hydraulic operated burnishing lathe of new design was installed. The lathe is a development of Baldwin-Lima-Hamilton Corp., Hamilton, O.

Burnishing, formerly a manual operation on axle turning lathes, is now done as an almost completely mechanized operation. Predetermined pressure is applied hydraulically and automatically held constant on the burnishing wheels while the axle is motor driven at 220 rpm, and the selected feed speed is maintained between 1 and 20 in. per minute. Close controls

Headquarters for

52100

Steel Tubing and Bars

Largest Stocks in the Country

of this versatile steel. 52100 is hard, tough and long-wearing, yet it's easy to machine and is right for bearings, sleeves, pins, collars and many other machine parts.

Over 200 seamless tube sizes to choose from .898″ O.D. to 8.250″ O.D. Bar sizes from .171″ round to 7.5″ round. Also ring forgings in any analysis.

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New Headquarters of Peterson Steels, Inc., Union, New Jersey

PETERSON STEELS, INC.
DEPT. S SPRINGFIELD ROAD
UNION, NEW JERSEY
Detroit, Mich. • Chicago, Ill.

during the burnishing operation result in a uniformity of finish that is believed to be an important factor in further reduction of the number of hot boxes experienced on the road.

Time Saver — Use of the Niles burnishing lathe has cut burnishing time 25 per cent in spite of the fact that it now requires setup on a separate special machine. An operator can burnish both journals of an axle at the same time and finish up to 10 axles per hour. Average output for a lathe is 65 axles for an 8-hour shift.

Manual labor is completely eliminated. Hydraulic devices under finger tip control position the axle in the machine, move the headstock driving plate and tailstock center against the ends of the axle with enough hydraulic pressure for the driving plate to turn the axle by means of frictional contact, and press each set of burnishing rolls against the axle at the desired pressure. Variable feed of roll carriages is hydraulically operated and controlled.

MACLEOD
ABRASIVE BLAST EQUIPMENT

BLAST CLEANING MACHINES

A complete line of direct pressure blast hose machines in a wide range of capacities. Portable or stationary types. Designed for blast cleaning difficult work where speed and strong abrasive action are required.

MACLEOD "AUTO-BLAST"

Completely Automatic Blast Machine

A double-chamber machine with a continuous, completely automatic blasting cycle. No shutdown time for reloading. Can be used with blast rooms, cabinets, tables, barrels, or special automatic devices.

BLAST CLEANING CABINETS

Illustration shows pit installation of pressure type machine and blast cleaning cabinet. Other Macleod Blast Cleaning Cabinets are available in a range of stock sizes or in special sizes to meet individual requirements. Macleod cabinets are continuous operating . . . use sand, steel, or manufactured abrasives equally well . . . come complete with many new automatic features that increase production and facilitate maintenance.

For descriptive literature on Macleod cabinets or machines write Dept. N

The MACLEOD Company

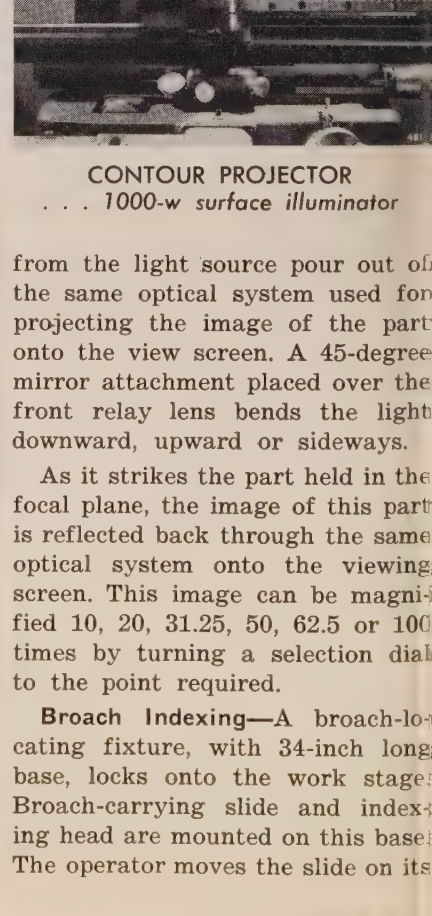
BOX 452, SHARONVILLE, OHIO ESTABLISHED 1897

Tooth Form Checking

Mirror attachment bends light whatever way required. Image can be magnified to 100 times

OPTICAL GAGING is making it possible to check all teeth of broaches for tooth form, spacing and wear for the entire length of a broach. In one design—Kodak's contour projector with its 1000-w surface illuminator — broaches themselves can be gaged optically as well as the product.

This optical system permits light to emanate from a high-intensity light source within the cabinet containing the optical system. By means of a telecentric mirror, rays

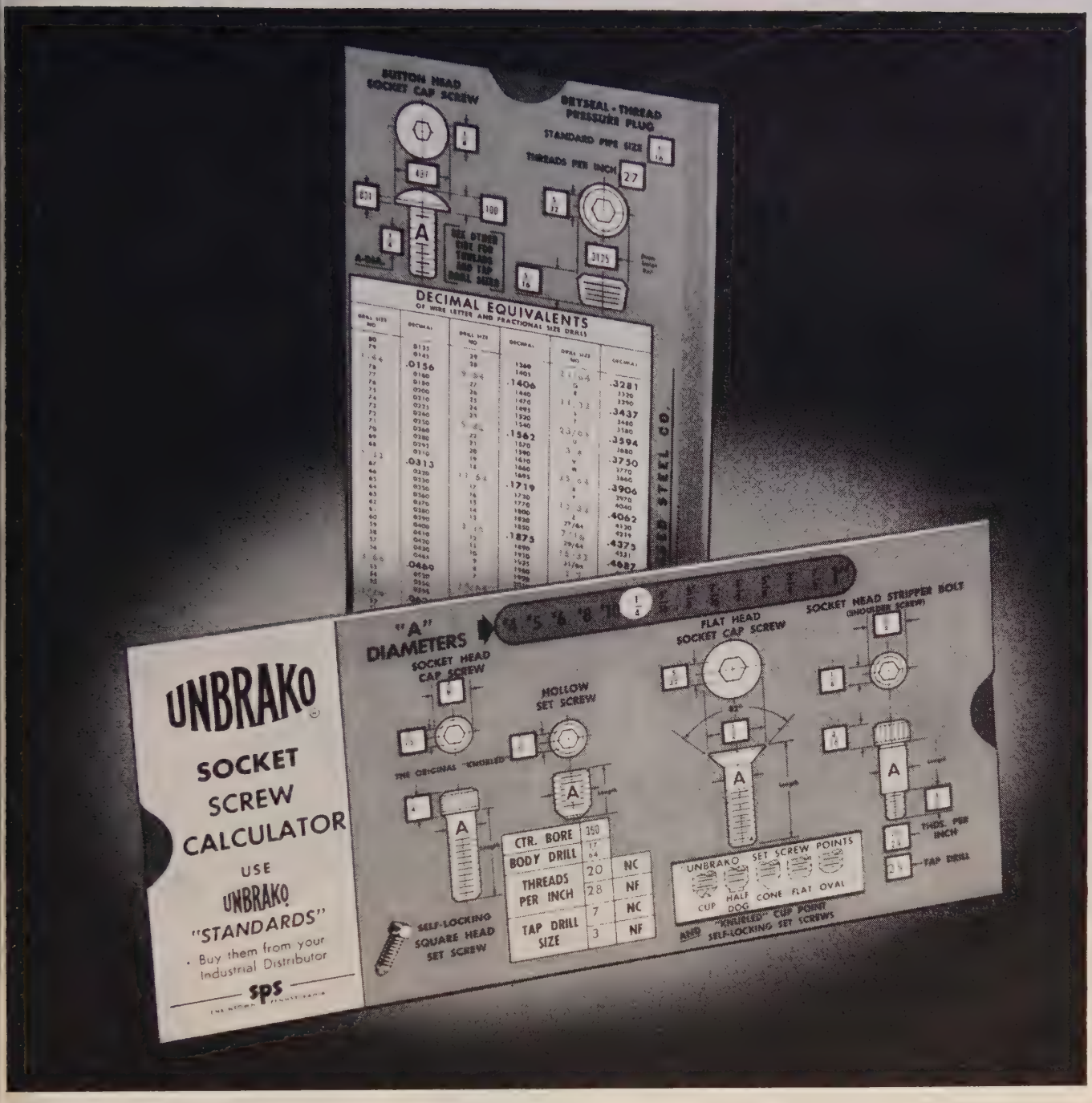


CONTOUR PROJECTOR
. . . 1000-w surface illuminator

from the light source pour out of the same optical system used for projecting the image of the part onto the view screen. A 45-degree mirror attachment placed over the front relay lens bends the light downward, upward or sideways.

As it strikes the part held in the focal plane, the image of this part is reflected back through the same optical system onto the viewing screen. This image can be magnified 10, 20, 31.25, 50, 62.5 or 100 times by turning a selection dial to the point required.

Broach Indexing—A broach-locating fixture, with 34-inch long base, locks onto the work stage. Broach-carrying slide and indexing head are mounted on this base. The operator moves the slide on its



Our New UNBRAKO Socket Screw Calculator—YOURS FOR THE ASKING

This handy pocket-sized slide-rule type socket screw calculator gives diameters, lengths, socket dimensions, threads and drill sizes—in fact, everything you want to know when using UNBRAKO socket screw products. And it's free.

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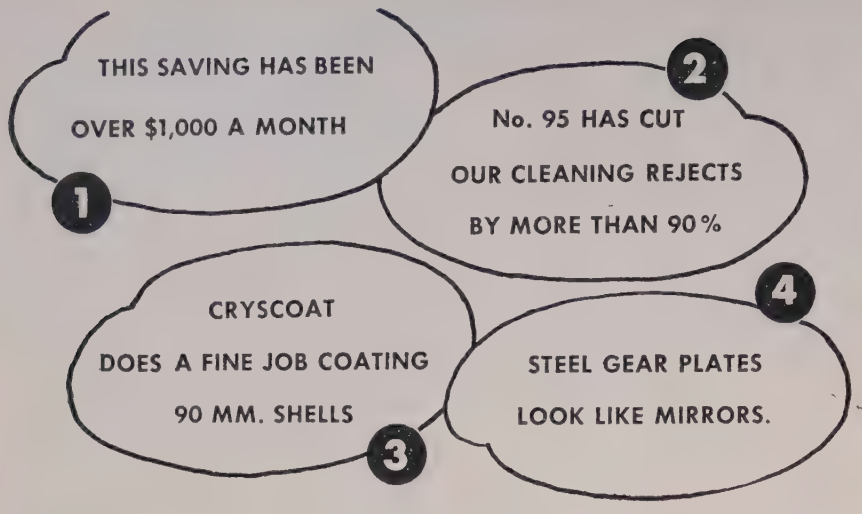
Self-Locking Set Screws • Flat Head Cap Screws • Shoulder Screws • Knurled Head Cap Screws • Dowel Pins • Button Head Socket Screws



We help our customers write success stories

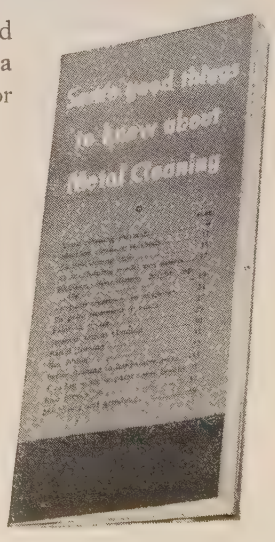
Every day 200 Oakite Technical Service Representatives use Oakite cleaning materials and methods to help thousands of Oakite customers accomplish metal-cleaning jobs that are important parts of big production operations.

When a busy customer sends a few words of appreciation, we treasure those words as a *success sentence* that we have helped write in his *success story*.

Here are brief explanations of the *success sentences* quoted above:

1. After 6 months use of Oakite Special Protective Oil for preventing rusting, this manufacturer of precision steel parts estimated savings at more than $6,000.
2. The use of Oakite Composition No. 95 for conditioning zinc-base die castings before plating cut cleaning rejects for this hardware manufacturer and showed other "very fine advantages."
3. Oakite CrysCoat HC put a heavy phosphate coating on 385,000 shells with "absolutely no trouble" according to a munitions maker, who added that "maintenance and control are very easy."
4. For burnishing, "Oakite Composition No. 3 is here to stay" says this maker of aircraft instrument parts, who adds "Pinions are polished to the roots of the gears. Magnesium parts are brilliant."

How about your success story? We'll be glad to tell you how we can help. Just drop a note to Oakite Products, Inc., 34E Rector St., New York 6, N. Y.



FREE Ask for our booklet "*Some good things to know about Metal Cleaning.*" It discusses our methods for:

Tank cleaning	Pre-paint treatment
Machine cleaning	Burnishing
Electrocleaning	Paint stripping
Pickling, deoxidizing	Rust prevention

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS • METHODS • SERVICE

Technical Service Representatives in Principal Cities of U. S. and Canada

ways by turning the pinion meshing with the rack attached to the slide's rear.

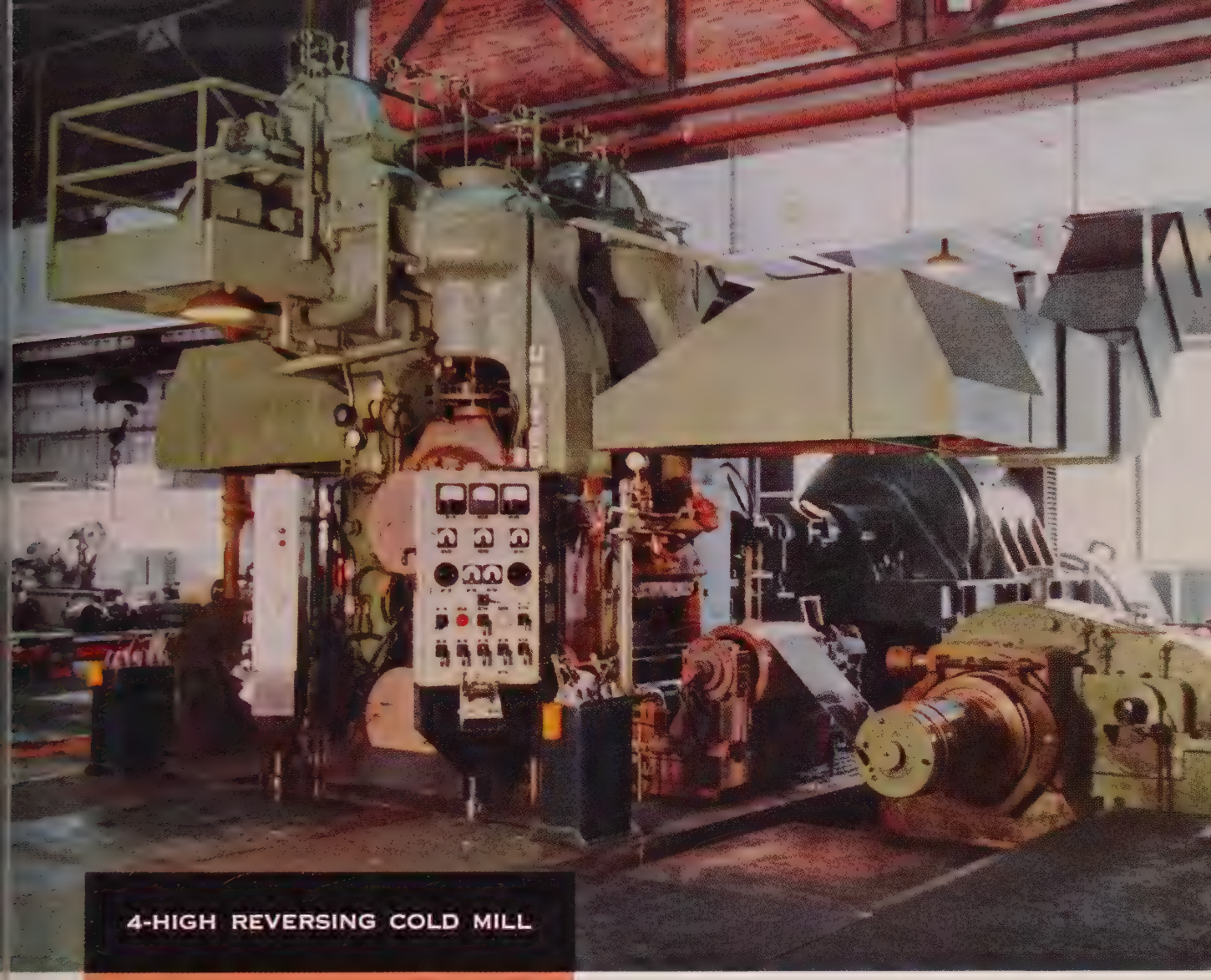
The broach, as placed on the fixture, rests against mounting blocks of the indexing slide member and against a magnetic stop at the end of the slide. Magnetic end stop is adjustable to allow for lateral movement of the broach if necessary without moving the entire fixture or work stage. When checking various teeth, the broach is indexed across the path of the optical system in accordance with indexing notches. Indexing head is fixed to the base member of the fixture and carries two metal mirrors that can be moved as a unit in and out between the broach teeth to positive stops at each end of its travel.

Light Direction — An adapter supplied with this fixture is inserted behind the projector's mirror attachment to extend focal position forward for the broach. Light coming from the 1000-w surface illuminator out of the optical system is directed by mirror attachment downward toward the two metal mirrors flanking any one row of broach teeth. Striking these mirrors, light reflects toward the opposite mirror, then returns upward through the same optical system from which it came. Result is a silhouette shadow of the tooth form being projected at desired magnification onto the viewing screen.

Contour of the teeth is checked against precision-made lines on the viewing screen and any deviation of tooth profile to the master lines can be noted readily and measured. Magnification used was 20 times although provisions were made for checking at 50 times the tooth form on the same chart.

Uniform Refractory Palletizing

Palletized handling of refractory brick is responsible for many problems—for both manufacturers and consumers. A manual recommending procedures is now available to make practices uniform, following a study by Refractories Institute's palletizing committee. Covered are the standard wooden pallet, load protection, carloading patterns, end and side gates. Additional material will be offered to deal with hacking patterns.



4-HIGH REVERSING COLD MILL

Designed and built by

UNITED

ENGINEERING AND FOUNDRY COMPANY

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Plants at: PITTSBURGH • VANDERGRIFT . NEW CASTLE • YOUNGSTOWN • CANTON

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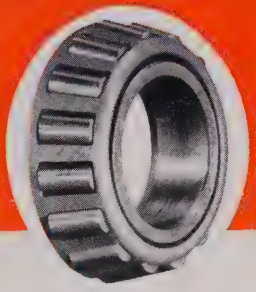
Are heat and water a problem? . . . lubricate with

MULTI-PURPOSE BENTONE GREASE



BENTONE *34 Grease

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BATTENFELD GREASE & OIL CORP.
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BEL-RAY CO., INC., Madison, N. J.
THE BROOKS OIL CO., Pittsburgh, Pa.
CATO OIL AND GREASE CO.
Oklahoma City, Okla.
CONSUMERS COOPERATIVE ASSOCIATION
Kansas City, Mo.
CRAWFORD EMULSIONS, Pittsburgh, Pa.
DENS-OIL LUBRICANT CO., Kansas City, Mo.
FISKE BROTHERS REFINING CO.
Newark, N. J.
FISKE BROTHERS REFINING CO.
Toledo, Ohio
THE FRANKLIN OIL AND GAS CO.
Bedford, Ohio
GENERAL LUBRICANTS CO.
Minneapolis, Minn.
GEORGIA-CAROLINA OIL CO.
Macon, Ga.
HICKORY SPECIALTY CO., INC.
Hickory, N. C.
HI-WAY REFINERIES, LTD.
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THE HODSON CORP., Chicago, Ill.
E. F. HOUGHTON & CO., Philadelphia, Pa.
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ILLICO INDEPENDENT OIL CO.
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KEYSTONE LUBRICATING CO.
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LUBRICATING CO. OF AMERICA
Los Angeles, Calif.
MacMILLAN OIL CO. OF ALLENTOWN
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For heavy duty, high temperature lubrication service in your mill operations, insist on a Bentone *34 compounded multi-purpose lubricant for longer, trouble-free service life under the most severe operating conditions.

In scores of plant operations throughout the industry, using all sizes and types of machinery, Bentone *34 greases have proved outstanding in heavy duty service, high temperature service, in metal adhesion, water resistance and stability on the toughest assignments. Bearing failures have been reduced to a minimum . . . lubricant life has been prolonged . . . and maintenance minimized.

For complete information on greases prepared with Bentone *34, the radically different non-soap gelling agent, write to your nearest supplier listed at left, or to:

BENTONE ★ 34

THE NON-SOAP GELLING AGENT

NATIONAL LEAD COMPANY
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P. O. Box 1675 Houston 1, Texas

* TRADEMARKS REGISTERED U. S. PAT. OFF.

4120

The Market Outlook

THERE'S little spring fever in steel buying. Although most consumers have enough steel to sustain their desired levels of production they are not inclined to slow down their pace of buying of the major forms of finished steel.

Buyers have at least three incentives: 1. Expectations, or at least hope, of continued good business; 2. protection against a remote possibility of a steel strike; and 3. belief that base prices of steel will go up after completion of steel wage negotiations.

BOOKED UP—As a result, steel producers quickly fill their order books for as far ahead as they are willing to open them. Full operations for the third quarter appear assured, and there is increasing belief the fourth quarter will be as good, although you can find people who think the latter will taper off a bit.

Puzzling the forecasters is the automobile industry. Will its business hold up? It's the biggest consumer of steel, so its effect on demand is mighty. The auto industry is still projecting hefty production schedules.

NO DISMAY—In the home appliance industry, however, production has outstripped demand, and some producers are reducing output. Nevertheless, that industry is still reluctant to cut back on steel purchases.

Consequently, conversion steel and imports still figure prominently in current buying.

STOIC ACCEPTANCE—With over-all demand for steel so strong, there has been little or no complaint over the rise in steel prices. A few of the increases have been on base prices but most of them have been on extras. In some cases, the revisions in extras will alter consumers' buying patterns. One effect of the changes in extras is the reduction of incentive to buy cold-rolled steel sheet in coil form and slit it into strip rather than to pay the price for cold-rolled strip. In the popular gages and widths of the two products the differential is reduced $2 to $4 a ton.

NEW EXTRAS—Users of steel plates will review their buying patterns too. Most mills not only have revised various existing extras but have added some new ones. New width extras have resulted from the establishment of over 60 inches as base, compared with over 48 inches, and new thickness extras have come from a change in the base from ⅜ inch to ½ inch. New odd gage extras have been instituted. They will add about $3 per ton to the cost of plates that are of a thickness different from those listed in the extra books' tables of even gages.

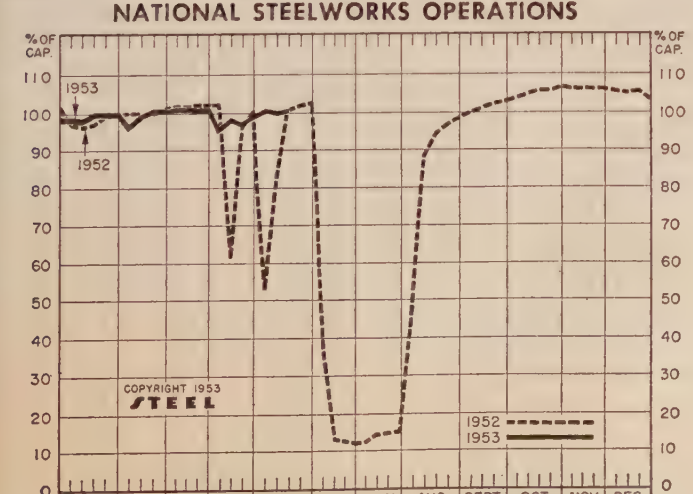
As a result of increased mill extras on shapes, plates and bars, structural fabricators are beginning to quote on a generally higher level, but not all of the increased costs are being passed along. Competition, particularly among the smaller shops, still is keen.

IN DEMAND—With automobile output at a high level, demand for hot-rolled and cold-rolled steel sheets exceeds supply. The appliance industry, which also is helping to account for the strong demand for cold-rolled sheets, is making good business for sellers of electrical sheets and enameling sheets. In relatively easy supply are galvanized sheets.

Most bar mills are well behind on commitments, and it appears that demands on them will be strong as long as the automotive industry sustains present schedules and as long as shell requirements keep their current pace.

Because of the high level of industrial production, demand for manufacturers' wire is strong.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended May 16	Change	Same 1952	Week 1951
Pittsburgh	98.5	+ 5.5*	10.5	97
Chicago	106	— 0.5*	103	107.5
Mid-Atlantic	97.5	0	88	101.5
Youngstown	105	— 1	105	105
Wheeling	101	0	97.5	98.5
Cleveland	101.5	0*	103.5	100
Buffalo	106.5	0	104	104
Birmingham	102	0	102	100
New England	93	+ 1	70	91
Cincinnati	97	— 0.5	90	101
St. Louis	92	0	83.5	96.5
Detroit	114.5	+ 6.5	101.5	107.5
Western	110	+ 1	84	104
Estimated National Rate	100.5	+ 0.5	101	104

*Change from preceding week's revised rate.

Weekly steelmaking capacity is estimated at 2,254,459 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

The Metalworking Outlook—p. 39 Production-Engineering News—p. 89

Composite Market Averages

FINISHED STEEL PRICE INDEX: Bureau of Labor Statistics (1947-1949=100)	May 12 1953	May 5 1953	Month Ago	April Average
	133.5	132.5*	130.7	130.7

*Revised

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended May 12, 1953

Units are 100 lb except where otherwise noted. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$4.075	Sheets, C.R. carbon	$5.275
Track spikes	6.725	Sheets, galv.	6.765
Track bolts	10.175	Strip, C.R., carbon	5.100
Tie plates	4.925	Strip, C.R. stainless (lb)	0.333
Joint bars	5.075	Pipe, black, buttweld (100 ft).	7.090
Plates, carbon	4.288	Pipe, galv., buttweld (100 ft).	8.778
Structural shapes	4.400	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.580	Tin plate (100 lb base box)	8.950
Bars, 3120 alloy	7.025	Terne plate (100 lb base box).	7.750
Bars, stainless (lb)	0.153	Wire, carbon, merchant	6.392
Bars, carbon	4.400	Wire, fence, galv.	7.017
Bars, reinforcing	4.250	Nails (100 lb kegs)	7.410
Bars, C.F. carbon	6.275	Wire, barbed (80 rod spool)	6.160
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod roll)	13.629

FINISHED PRICE INDEX, Weighted: Calculated by STEEL*

	May 14 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	181.31	181.31	181.31	171.92	135.02
Index in cents per lb.	4.912	4.912	4.912	4.657	3.658

ARITHMETICAL PRICE COMPOSITES: Calculated by STEEL*

Finished Steel NT	$110.98	$110.98	$110.98	$106.32	$80.27
No. 2 Fdry, Pig Iron, GT	55.04	55.04	55.04	52.54	39.56
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	39.21
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	40.29
Steelmaking Scrap, GT	38.83	39.67	43.42	43.00	40.67

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	May 7 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.875
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.875
Bars, H.R., del. Philadelphia	4.502	4.502	4.502	4.252	3.356
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.50
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.775
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.775
Shapes, del., Philadelphia	4.13	4.13	4.13	3.93	2.98
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.925
Plates, Chicago	3.90	3.90	3.90	3.70	2.925
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.45
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.65
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60–75	2.775
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.775
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.50
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.50
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.76
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H. R., Pitts.	3.975-4.225	3.975-4.225	3.975-4.225	3.75-4.00	3.05
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.775
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.65-5.35	3.775
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.60
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.735
Wire, Basic, Pitts.	5.475-5.225	5.475-5.225	5.475-5.225	4.85-5.10	3.725
Nails, Wire, Pittsburgh	6.35	6.35	6.35	5.90-6.20	5.125
Tin plate, box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$6.65
SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$54.00
Wire rods, 7/32-⅜", Pitts.	4.425	4.425	4.425	4.10–30	3.175
PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$40.00
Basic, Valley	54.50	54.50	54.50	52.00	39.00
Basic, del, Phila.	59.25	59.25	59.25	56.75	42.17
No. 2 Fdry, Pitts.	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, Chicago	55.00	55.00	55.00	52.50	39.00
No. 2 Fdry, Valley	55.00	55.00	55.00	52.50	39.50
No. 2 Fdry, del. Phila.	59.75	59.75	59.75	57.25	42.67
No. 2 Fdry, Birm.	51.38	51.38	51.38	48.88	37.88
No. 2 Fdry (Birm.) del. Cin.	58.93	58.93	58.93	55.49	42.71
Malleable, Valley	55.00	55.00	55.00	52.50	39.50
Malleable, Chicago	55.00	55.00	55.00	52.50	39.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	55.00
Ferromanganese, Etna, Pa.	200.00†	196.07†	196.07†	188.00‡	151.00*

*F.o.b. cars, Pittsburgh; 78-82% Mn, per gross ton. †74-76% Mn, per net ton. ‡78-82% Mn, per gross ton.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$39.50	$39.50	$44.00	$44.00	$40.25
No. 1 Heavy Melt, E. Pa.	41.00	42.00	43.50	42.50	42.50
No. 1 Heavy Melt, Chicago	36.00	37.50	42.75	42.50	39.25
No. 1 Heavy Melt, Valley	41.50	41.50	42.75	44.00	40.25
No. 1 Heavy Melt, Cleve.	39.00	39.00	42.75	43.00	39.75
No. 1 Heavy Melt, Buffalo	41.75	41.75	45.50	43.00	44.50
Rails Rerolling, Chicago	47.50	49.00	52.00	52.50	52.50
No. 1 Cast, Chicago	41.50	41.50	42.50	49.00†	69.00

†F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$12.75
Beehive, Fdry, Connlsvl.	17.00	17.00	17.00	17.50	14.875
Oven Fdry, Chicago	24.50	24.50	24.50	23.00	19.50

PIG IRON

F.o.b. furnace prices as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies on pages 186-187.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.	....	60.78	61.28	....
Newark, del.	59.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity, Ala. R2	50.88	51.38	....	....
Birmingham R2	50.88	51.38	....	....
Birmingham S9	....	51.38	....	....
Woodward, Ala. W15	50.88	51.38	....	....
Cincinnati, del.	....	58.93	....	....
Buffalo District				
Buffalo R2	54.50	55.00	55.50	....
Buffalo H1	54.50	55.00	55.50	....
Tonawanda, N.Y. W12	54.50	55.00	55.50	....
No. Tonawanda, N.Y. T9	....	55.00	55.50	....
Boston, del.	65.15	65.65	66.15	....
Rochester, N.Y., del.	57.52	58.02	58.52	....
Syracuse, N.Y., del.	58.62	59.12	59.62	....
Chicago District				
Chicago I-3	54.50	55.00	55.00	55.50
Gary, Ind. U5	54.50	....	55.00	....
IndianaHarbor, Ind. I-2	54.50	....	55.00	....
So. Chicago, Ill. W14	54.50	55.00	55.00	....
So. Chicago, Ill. Y1	54.50	55.00	55.00	....
So. Chicago, Ill. U5	54.50	....	55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon, Mich., del.	....	61.30	61.30	....
Cleveland District				
Cleveland A7	54.50	55.00	55.00	55.50
Cleveland R2	54.50	55.00	55.00	....
Akron, O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain, O. N3	54.50	....	....	55.50
Duluth I-3	....	....	55.00	....
Erie, Pa. I-3	54.50	55.00	55.00	55.50
Everett, Mass. E1	....	59.50	60.00	....
Fontana, Calif. K1	60.50	61.00	....	....
GraniteCity, Ill. G4	56.40	56.90	57.40	....
St. Louis, del. (inc. tax)	57.15	57.65	58.15	....
Ironton, Utah C11	54.50	55.00	....	....
Geneva, Utah C11	54.50	55.00	....	....
LoneStar, Tex. L6	50.50	*51.00	51.00	....
Minnequa, Colo. C10	56.50	57.50	57.50	....
Rockwood, Tenn. T3	....	....	58.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	....	55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge Aliquippa, del.	....	56.37	56.37	56.87
McKeesRocks, del.	....	56.04	56.04	56.54
Lawrenceville, Homestead, Wilmerding, Monaca, del.	....	56.66	56.66	57.16
Verona, Trafford, del.	....	57.19	57.19	57.69
Brackenridge, del.	....	57.45	57.45	57.95
Bessemer, Pa. U5	54.50	....	55.00	55.50
Clairton, Rankin, So. Duquesne, Pa. U5	54.50	....	....	....
McKeesport, Pa. N3	54.50	....	....	55.50
Monessen, Pa. P7	56.50	....	....	....
Sharpsville, Pa. S6	....	....	55.00	55.50
Steelton, Pa. B2	56.50	57.00	57.50	58.00
Swedeland, Pa. A3	58.50	59.00	59.50	60.00
Toledo, O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47	....	....
Troy, N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard, O. Y1	54.50	55.00	55.00	....
Youngstown Y1	54.50	55.00	55.00	....
Youngstown U5	54.50	....	....	55.50
Mansfield, O., del.	59.15	59.65	59.65	60.15

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$65.50
Buffalo H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., OH & Fdry., freight allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton, Pa. B2	62.50
Philadelphia, delivered	66.03
Troy, N.Y. R2	62.50

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NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 29.75-30.00c, Conn. Valley; Lake nom.; foreign electrolytic, del. 29.50-30.00c.

Brass Ingots: 85-5-5-5 (No. 115) 26.00c; 88-10-2 (No. 215) 34.75c; 80-10-10 (No. 305) 30.00c; No. 1 yellow (No. 405) 21.25c.

Zinc: Prime western 11.00c; brass special 11.25c, intermediate 11.50c; East St. Louis; high grade 12.35c, and special high grade 12.50c delivered.

Lead: Common 12.30c; chemical 12.40c; corroding, 12.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 20.50c, pigs 19.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 22.50-23.50; No. 12 foundry alloy (No. 2 grade) 22.00-22.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.00-24.00; grade 2, 22.50-23.50; grade 3, 21.50-22.00; grade 4, 20.50-21.00.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 27.00c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt RFC, 121.50c; outside market 97.00c.

Antimony: American 99-99.8% and over but not meeting specifications below 34.50c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 35.00c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 60.00c; 25-lb pigs, 62.65c; "XX" nickel shot, 63.65c; "F" nickel shot or ingots, for addition to cast iron, 60.00c. Prices include import duty.

Mercury: Open market, spot, New York, $195-$198, per 76-lb flask.

Cadmium: "Regular" straight or flat forms, $2 deld.; special or patented shapes $2.15.

Beryllium-Copper: 3.75-4.25% Be, $40.00 per lb of contained beryllium, with balance as copper at market price on date of shipment, f.o.b. Reading, Pa., or Elmore, O.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 85.25c per oz.

Platinum: $90-$93 per ounce from refineries.

Paladium: $23-$24 per troy ounce.

Iridium: $165-$175 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Cents per pound, f.o.b. mill, effective Apr. 1, 1953. Listings are lowest quotations.)

Sheet: Copper 50.48; yellow brass 42.87; commercial bronze, 95% 49.89; 90% 48.76; red brass, 85% 47.11; 80% 45.99; best quality, 44.43; nickel silver, 18%, 59.84; phosphor-bronze grade A, 5%, 70.50.

Rod: Copper, hot-rolled 46.83; cold-drawn 48.08; yellow brass free cutting, 36.68; commercial bronze 95% 49.58; 90% 48.45; red brass 85%, 46.80; 80%, 45.68.

Seamless Tubing: Copper 50.42; yellow brass 45.78; commercial bronze, 90%, 51.32; red brass, 85%, 49.92.

Wire: Yellow brass 43.16; commercial bronze, 95%, 50.18; 90%, 49.05; red brass, 85%, 47.40; 80%, 46.28; best quality brass, 44.72.

(Base prices, effective Apr. 1, 1953)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 37.46; 30,000 lb lots, 37.58; l.c.l. 38.08. Weatherproof, 100,000 lb, 37.85; 30,000 lb, 38.10; l.c.l., 38.60. Magnet wire del., 15,000 lb or more 43.93; l.c.l., 44.68.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Jan. 22, 1953.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	32.9	...	...
0.135-0.096	12-48	33.4	...	...
0.095-0.077	12-48	34.1	31.8	36.3
0.076-0.061	12-48	34.7	32.0	36.5
0.060-0.048	12-48	35.0	32.2	36.8
0.047-0.038	12-48	35.5	32.6	37.1
0.037-0.030	12-48	35.9	33.0	37.8
0.029-0.024	12-48	36.5	33.3	38.3
0.023-0.019	12-36	37.1	34.0	39.0
0.018-0.017	12-36	37.9	34.6	39.9
0.016-0.015	12-36	38.8	35.4	41.1
0.014	12-24	39.8	36.4	42.4
0.013-0.012	12-24	40.9	37.1	43.4
0.011	12-24	41.9	38.3	45.0
0.010-0.0095	12-24	43.1	39.4	46.6
0.009-0.0085	12-24	44.3	40.7	48.5
0.008-0.0075	12-24	45.8	41.9	50.3
0.007	12-18	47.3	43.4	52.6
0.006	12-18	48.9	44.8	57.6

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— 17S-T4	Hexagonal 17S-T4
0.125	56.8	...
0.156-0.188	48.0	...
0.219-0.313	45.3	...
0.375	43.7	52.4
0.406	43.7	...
0.438	43.7	52.4
0.469	43.7	...
0.500	43.7	52.4
0.531	43.7	...
0.563	43.7	49.2
0.594	43.7	...
0.625	43.7	49.2
0.688	43.7	49.2
0.750-1.000	42.6	46.4
1.063	42.6	44.8
1.125-1.500	41.0	44.8
1.563	40.5	...
1.625	39.8	43.2
1.688-2.000	39.8	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $17.50 per cwt; add 50c cwt 100 sq ft to 140 sq ft. Pipe: Full coils $17.50 per cwt. Traps and bends: List prices plus 30%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 20.75-21.75c; over 12-in., 20.75-21.75c.

"A" NICKEL

(Base prices f.o.b. mill, effective Mar. 9, 1953) Sheets, cold-rolled 86.50c. Strip, cold-rolled 92.50c. Rods and shapes, 82.50c. Plates, 84.50c. Seamless tubes 115.50c.

MONEL

(Base prices f.o.b. mill, effective Mar. 9, 1953) Sheets, cold-rolled 67.50c. Strip, cold-rolled 70.50c. Rods and shapes, 65.50c. Plates 66.50c. Seamless tubes, 100.50c. Shot and blocks, 57.00c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb 58.00c-65.00c; 25 to 99 lb, 48.00c-55.00c; 100 lb to 5000 lb, 44.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 42.18c; oval 41.68c.

Nickel Anodes: Rolled, oval, carbonized, carloads 81.00c; 5000 to 29,999 lb, 83.00c; 500 to 4999 lb, 85.00c; 1 to 499 lb, 89.00c, f.o.b. Cleveland.

Nickel Chloride: In 100 lb bags; 10,000 lb and over, 37.00c; 5000 to 9900 lb, 38.00c; 400 to 4900 lb, 40.00c; 300 lb, 42.00c; 200 lb, 43.00c; 100 lb, 45.00c, f.o.b. Cleveland.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers $1.10 per lb; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac. Based on $1.215 tin.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers. Based on $1.215 tin.

Stannous Chloride (Anhydrous): In 400 lb bbl, $1.25; 100 lb kegs $1.26, f.o.b. Carteret, N. J., freight allowed on 100 lb or more. Based on $1.215 tin.

Scrap Metals

Brass Mill Allowances

(Prices in cents per pound for less than 20,000 pounds, f.o.b. shipping point; on lots over 20,000 pounds at one time, of any or all kinds of scrap, add 1 cent per pound.)

	Clean Heavy	Rod Ends	Clean Turnings
Copper	28.625	28.625	27.875
Yellow Brass	21.375	21.125	19.625
Commercial Bronze			
95%	27.250	27.000	26.500
90%	26.125	25.875	25.375
Red Brass			
85%	25.125	24.875	24.375
80%	24.125	23.875	23.375
Best Quality(71-80%)	22.500	22.250	21.750
Muntz metal	20.000	19.750	19.250
Nickel silver, 10%	25.250	25.000	12.625
Phos. Bronze, A	30.625	30.375	29.375
Naval Brass	20.000	19.750	19.250
Manganese Bronze	20.000	19.750	19.250

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 22.50-23.00; No. 2 copper 21.50-22.00; light copper 20.00-20.50; refinery brass (60% copper) per dry copper content 20.00.

INGOT MAKERS' COPPER AND BRASS SCRAP BUYING PRICES

(Cents per pound, carlots, delivered)

No. 1 copper 22.50-23.50; No. 2 copper, 21.00-22.00; light copper 19.50-20.50; No. 1 composition borings 17.50, nom.; No. 1 composition solids, 18.00, nom.; radiators, 13.50-14.00, nom.; heavy yyellow brass solids, 13.50, nom.; yellow brass turnings 11.50-12.50.

SMELTERS' BUYING PRICES FOR SCRAP ALUMINUM

(Carlots, delivered)

2S aluminum clippings, 15.50-16.00c; mixed clippings, 14.00-15.00c; old aluminum sheet, 12.50-13.50c; old aluminum cast, 12.50-13.50c; borings and turnings, 12.50-13.50c.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 21.00-22.00; No. 2 19.00; light copper 17.50; No. 1 composition red brass 17.00; No. 1 composition turnings 16.50; mixed brass turnings 10.00; new brass clippings 17.50; No. 1 brass rod turnings 16.00; light brass 10.00; heavy yellow brass 12.50; new brass rod ends 16.50; auto radiators, unsweated 13.00; cocks and faucets 15.00; brass pipe 16.00.

Aluminum: Clippings 2S 11.50; old sheets 8.00; crankcase 8.00; borings and turnings 5.50; pistons and struts 5.00.

Tin: No. 1 pewter 55.00; block tin pipe 80.00; No. 1 babbitt 45.00.

Lead: Heavy 9.25-9.75; battery plates 4.75-5.00; linotype and stereotype 11.00-11.50; electrotype 9.25-9.50; mixed babbitt 13.75-14.00.

Zinc: Old zinc, 4.50; new die cast scrap, 4.50; old die cast scrap, 3.50.

Nickel: Sheets and clips $1.00; rolled anodes $1.00; turnings 85.00; rod ends $1.00.

Monel: Clippings 33.00; old sheet 30.00; turnings 25.00; rods 33.00.

DAILY PRICE RECORD

1953	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 13-14	29.75-30.00	12.30	11.00	97.00	20.50	34.50	60.00	85.25
May 11-12	29.75-30.00	12.30	11.00	96.50	20.50	34.50	60.00	85.25
May 8-9	29.75-30.00	12.30	11.00	99.00	20.50	34.50	60.00	85.25
May 6-7	29.50-30.00	12.30	11.00	100.00	20.50	34.50	60.00	85.25
May 5	29.50-30.00	12.30	11.00	98.00	20.50	34.50	60.00	85.25
May 4	29.50-30.00	12.30	11.00	96.50	20.50	34.50	60.00	85.25
May 1-2	29.50-30.00	12.30	11.00	93.00	20.50	34.50	60.00	85.25
Apr. Avg.	30.755	12.473	11.00	102.567	20.50	34.50	60.00	85.25
Apr. 29-30	29.50-30.00	12.30	11.00	95.00	20.50	34.50	60.00	85.25
Apr. 28	29.75-30.00	11.80	11.00	96.00	20.50	34.50	60.00	85.25
Apr. 24-27	29.50-30.00	11.80	11.00	94.00	20.50	34.50	60.00	85.25
Apr. 23	29.50-30.00	11.80	11.00	92.00	20.50	34.50	60.00	85.25
Apr. 22	30.00	11.80	11.00	93.50	20.50	34.50	60.00	85.25
Apr. 20-21	30.00-30.50	11.80	11.00	95.00	20.50	34.50	60.00	85.25
Apr. 17-18	30.00-30.50	12.30	11.00	97.50	20.50	34.50	60.00	85.25
Apr. 16	30.00-30.50	12.30	11.00	98.00	20.50	34.50	60.00	85.25
Apr. 15	30.00-32.00	12.30	11.00	95.00	20.50	34.50	60.00	85.25

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9% base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

The Metal Market

Aluminum output in the third quarter will be larger than ever before, but heavy stockpiling by the government will cut industry's supply below normal patterns

THINGS are again popping in aluminum. This sector of the fast-shifting metals scene had been uncommonly quiet in recent weeks as producers strove to catch up with astounding demand from industry.

Yet all the time a number of developments were in the wind. They're beginning to break now. Here's a rundown of what's happening and what's likely to happen.

Setasides—Primary producers, independent fabricators and secondary smelters have gotten the word from NPA of quantities of various aluminum forms and shapes they must set aside to fill authorized controlled materials orders in the third quarter under the defense materials system.

Average for all products figures out at about 32 per cent, T. A. Lynch, director, Aluminum & Magnesium Division, NPA, told STEEL. Highest percentages naturally will be in high alloy materials, in greatest defense demand.

Stockpiling—As was expected, the Office of Defense Mobilization reached a compromise decision on aluminum stockpiling for the third quarter. Stockpile question has been the subject of a running feud between government and aluminum producers for some time.

NPA estimates total aluminum supply at 400,000 tons for each of the first two quarters of this year. Industry says though supply will be larger than ever before during the third quarter, heavy stockpiling will reduce industry's supply below normal patterns.

Expansion—Two of the three participants in the "Third Round Expansion" are in trouble. Olin Industries (110,000 tons capacity proposed) and Wheland Co. (50,000 tons capacity proposed) find themselves unable to proceed with their projects without further financial assistance from the government.

The two companies have not withdrawn from the program, points out E. A. Harris, Materials Division, ODM. They can't see their way clear to go ahead without further help forthcoming though. The problem is purely and simply a financial one. Olin would have to risk assets of its other divisions to dig up the $170 million needed to get started. It has sites under option and details of its plans are thoroughly completed, contrary to some industry speculation. Wheland likewise has its plans fully drawn. The government's new policy regarding public power projects is also said to be a factor that will hurt chances of the two companies ever getting into the aluminum business.

Imports—In the last 18 months nearly 100,000 tons of Canadian aluminum under contract to the British government have been diverted to the U. S. Deliveries in the first half of 1953 will top 50,000 tons. Now the goverment is reported asking Aluminum Co. of Canada to repeat in the third and fourth quarters what it did in the first and second.

Alcan must first get a go-ahead from the U. K. government. With slack markets abroad this shouldn't be too difficult. Some government men see the key to aluminum supply-demand balance in the extent of imports. They doubt if balance could be achieved unless we get more imports and keep stockpile take low. Industry says it could catch up this summer if stockpiling were deferred.

Deliveries—Customers report varying degrees of luck in placing orders for aluminum. One reported a mill told him it was completely sold out through October. It's not as bad as that everywhere or in all products though. Producers are now booking orders for July in sheet and extrusions. Forging stock is tough to get, but because it doesn't require heat treating at the mill, catch-up will come quickly as more primary metal becomes available.

Extrusion capacity is used fully now and delivery time depends on alloy involved. Production is about five times faster on the soft alloys than on some of the hard ones. Foil is no problem as a pound of raw metal goes a long way here. Mills must take A-E orders first against setasides under DMS. Some producers believe there will be a good tonnage of material that can be made available to civilian industry in the third quarter after defense orders are subtracted from setasides.

Production—The U. S. aluminum industry broke all-time daily, monthly and quarterly records in March, reports the Aluminum Association. The March primary turnout of 104,454 tons was 11 per cent over the previous high, set in October, 1943. Quarterly production amounted to 287,004 tons.

More new records can be expected as the expansion program still isn't complete. Sheet, foil and castings shipments were all well over February levels.

Copper Price Strengthens

Copper price is strengthening slightly, a great surprise to many in the industry. Only one custom smelter is pricing below 30 cents today. Secondary output is about to drop from the phenomenal heights of 20,000 tons monthly to a more normal 12,000 to 15,000, which is still well over last year. Imports of primary copper are now running at close to 20,000 tons monthly, which cuts into Chile's market, normally about 30,000 tons. Copper buyers are quickening their pace for June. Several weeks ago they were shopping around and taking plenty of time. The temporary market firming helped them make up their minds.

There's little or no No. 1 copper scrap available at any price except on existing contracts, taken before prices broke. Brass mills are taking all the good grades. No. 2 copper is available at 22.5 cents in tonnage quantities, and red brass at 19.5 to 20 cents. Demand for brass and bronze ingot metal remains in the doldrums.

COPPER PRODUCTS SET ASIDE
under Defense Materials System

	Unalloyed	Alloyed
BRASS MILL PRODUCTS:		
Plate, sheet, strip, rolls	20%	30%
Rod, bar, shapes, wire	20%	40%
Seamless tube, pipe	15%	55%
COPPER WIRE MILL PRODUCTS:	26%	
COPPER FOUNDRY PRODUCTS:	30%	

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on pages 150-151.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$81.00
Munhall,Pa. U5 .....54.00
Seattle S24 .....75.00

INGOTS Alloy (NT)
Detroit R7 .....$57.00
Fontana,Calif. K1 ....83.00
Houston S5 .....65.00
Midland,Pa. C18 .....57.00
Munhall,Pa. U5 .....57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$59.00
Clairton,Pa. U5 .....59.00
Ensley,Ala. T2 .....59.00
Fairfield,Ala. T2 .....59.00
Fontana,Calif. K1 ....78.00
Gary,Ind. U5 .....59.00
Johnstown,Pa. B2 .....59.00
Lackawanna,N.Y. B2 ..59.00
Munhall,Pa. U5 .....59.00
So.Chicago,Ill. U5 ....59.00
So.Duquesne,Pa. U5 ..59.00
Carbon, Forging (NT)
Bessemer,Pa. U5 .....$70.50
Buffalo R2 .....70.50
Canton,O. R2 .....70.50
Clairton,Pa. U5 .....70.50
Cleveland R2 .....70.50
Conshohocken,Pa. A3 ..77.50
Detroit R7 .....73.50
Ensley,Ala. T2 .....70.50
Fairfield,Ala. T2 .....70.50
Fontana,Calif. K1 ....89.50
Gary,Ind. U5 .....70.50
Geneva,Utah C11 .....70.50
Houston S5 .....78.50
Johnstown,Pa. B2 ....70.50
Lackawanna,N.Y. B2 ..70.50
LosAngeles B3 .....89.50
Munhall,Pa. U5 .....70.50
Seattle B3, S24 .....89.50
So.Chicago R2,U5,W14.70.50
So.Duquesne,Pa U5 ...70.50
So.SanFrancisco B3 ..89.50
Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$76.00
Buffalo R2 .....76.00
Canton,O. R2 .....76.00
Canton,O. T7 .....78.60
Conshohocken,Pa. A3 ..83.00
Detroit R7 .....79.00
Fontana,Calif. K1 ....95.00
Gary,Ind. U5 .....76.00
Houston S5 .....84.00
Ind.Harbor,Ind. Y1 ....76.00
Johnstown,Pa. B2 ....76.00
Lackawanna,N.Y. B2..76.00
LosAngeles B3 .....96.00
Massillon,O. R2 .....76.00
Midland,Pa. C18 .....76.00
Munhall,Pa. U5 .....76.00
Seattle S24 .....96.00
So.Chicago R2,U5,W14.76.00
So.Duquesne,Pa. U5 ..76.00
Struthers,O. Y1 .....76.00
Warren,O. C17 .....76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$87.50
Canton,O. R2 .....87.50
Cleveland R2 .....87.50
Fontana,Calif. K1 ....108.50
Gary,Ind. U5 .....87.50
Massillon,O. R3 .....87.50
So.Chicago,Ill. R2 ....87.50
So.Duquesne,Pa. U5 ..87.50

SHEET BARS (NT)
Fontana,Calif. K1 ...$93.18

SKELP
Aliquippa,Pa. J5 .....3.65
Munhall,Pa. U5 .....3.55
Warren,O. R2 .....3.55
Youngstown R2, U5 ...3.55

WIRE RODS
Alton,Ill. L1 .....4.70
AlabamaCity,Ala. R2 ..4.325
Buffalo W12 .....4.325
Cleveland A7 .....4.325
Donora,Pa. A7 .....4.325
Fairfield,Ala. T2 .....4.325
Fontana,Calif. K1 ....5.125
Houston S5 .....4.725
Johnstown,Pa. B2 ....4.325
Joliet,Ill. A7 .....4.325
KansasCity,Mo. S5 ....4.665
LosAngeles B3 .....5.125
Minnequa,Colo. C10 ...4.575
Monessen,Pa. P7 .....4.525
No.Tonawanda,N.Y.B11 4.325
Pittsburg,Calif. C11 ...4.975
Portsmouth,O. P12 ....4.525
Roebling,N.J. R5 ....4.425
So.Chicago,Ill. R2 ....4.325
SparrowsPoint,Md. B2..4.425
Sterling,Ill.(1) N15 ...4.325
Struthers,O. Y1 .....4.325
Torrance,Calif. C11 ...5.125
Worcester,Mass. A7 ...4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ...4.675
Lackawanna,N.Y. B2 ..4.675
Munhall,Pa. U5 .....4.675
So.Chicago,Ill. U5 ....4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.85
Aliquippa,Pa. J5 .....3.85
Bessemer,Ala. T2 .....3.85
Bethlehem,Pa. B2 ....3.90
Clairton,Pa. U5 .....3.85
Fairfield,Ala. T2 .....3.85
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.85
Geneva,Utah C11 .....3.85
Houston S5 .....4.25
Ind.Harbor,Ind. I-2 ....3.85
Johnstown,Pa. B2 .....3.90
KansasCity, Mo. S5 ....4.45
Lackawanna,N.Y. B2 ..3.90
LosAngeles B3 .....4.45
Minnequa,Colo. C10 ...4.30
Munhall,Pa. U5 .....3.85
Niles,Calif.(22) P1 .....4.56
Phoenixville,Pa. P4 ....4.95
Seattle B3 .....4.50
So.Chicago,Ill. U5, W14.3.85
So.SanFrancisco B3 ....4.40
Torrance,Calif. C11 ....4.45
Weirton,W.Va. W6 ....4.10
Wide Flange
Bethlehem,Pa. B2 .....3.90
Clairton,Pa. U5 .....3.85
Fontana,Calif. K1 .....5.05
Lackawanna,N.Y. B2 ..3.90
Munhall,Pa. U5 .....3.85
So.Chicago,Ill. U5 ....3.85
Alloy Stand. Shapes
Clairton,Pa U5 .....4.725
Fontana,Calif. K1 ....6.125
Gary,Ind. U5 .....4.725
Munhall,Pa. U5 .....4.725
So.Chicago,Ill. U5 ....4.725
H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.80
Bessemer,Ala. T2 .....5.80
Bethlehem,Pa. B2 .....5.80
Clairton,Pa. U5 .....5.80
Fairfield,Ala. T2 .....5.80
Fontana,Calif. K1 ....6.45
Gary,Ind. U5 .....5.80
Geneva,Utah C11 .....5.80
Ind.Harbor,Ind. I-2 ....5.80
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
LosAngeles B3 .....6.35
Munhall,Pa. U5 .....5.80
Seattle B3 .....6.40
So.Chicago,Ill U5 .....5.80
So.SanFrancisco B3 ..6.30
Struthers,O. Y1 .....6.30
H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.80
Lackawanna,N.Y. B2 ..5.80
Munhall,Pa. U5 .....5.75
So.Chicago,Ill. U5 .....5.75
BEARING PILES
Munhall,Pa. U5 .....3.85
So.Chicago.Ill. U5 .....3.85
PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.95
Bessemer,Ala. T2 .....5.95
Clairton,Pa. U5 .....5.95
Cleveland J5, R2 .....5.95
Conshohocken,Pa. A3 ....6.20
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....5.95
Fontana,Calif.(30) K1 ..6.65
Gary,Ind. U5 .....5.95
Geneva,Utah C11 .....5.95
Ind.Harbor,Ind. I-2 ....5.95
Ind.Harbor,Ind. Y1 ....6.45
Johnstown,Pa. B2 .....5.95
Munhall,Pa. U5 .....5.95
Pittsburgh J5 .....5.95
Seattle B3 .....6.85
Sharon,Pa. S3 .....5.95
So.Chicago,Ill. U5 .....5.95
SparrowsPoint,Md. B2..5.95
Warren,O. R2 .....5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95
PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....5.35
Coatesville,Pa. L7 .....5.75
Conshohocken,Pa. A3 ..5.55
Fontana,Calif. K1 ....6.30
Gary,Ind. U5 .....5.25
Johnstown,Pa. B2 .....5.25
Munhall,Pa. U5 .....5.25
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.25
SparrowsPoint,Md. B2..5.25
FLOOR PLATES
Cleveland J5 .....4.95
Conshohocken,Pa. A3 ..4.95
Ind.Harbor,Ind. I-2 ....4.95
Munhall,Pa. U5 .....4.95
So.Chicago,Ill. U5 ....4.95
PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..4.15
Cleveland,c.l. R2 .....4.50
Warren,O., c.l. R2 ....4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.90
Aliquippa,Pa. J5 .....3.90
Ashland,Ky. (15) A10 ..3.90
Bessemer,Ala. T2 .....3.90
Clairton,Pa. U5 .....3.90
Claymont,Del. C22 ....4.35
Cleveland J5, R2 .....3.90
Coatesville,Pa. L7 .....4.35
Conshohocken,Pa. A3 ..4.35
Ecorse,Mich G5 .....4.45
Fairfield,Ala. T2 .....3.90
Fontana,Calif.(30) K1..4.55
Gary,Ind. U5 .....3.90
GraniteCity,Ill. G4 ....4.60
Geneva,Utah C11 .....3.90
Harrisburg,Pa. C5 .....6.50
Houston S5 .....4.30
Ind.Harbor,Ind. I-2, Y1.3.90
Johnstown,Pa. B2 .....3.90
Lackawanna,N.Y. B2 ..3.90
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....3.90
Pittsburgh J5 .....3.90
Seattle B3 .....4.80
Sharon,Pa. S3 .....4.15
So.Chicago,Ill. U5, W14.3.90
SparrowsPoint,Md. B2 3.90
Steubenville,O. W10 ....3.90
Warren,O. R2 .....3.90
Weirton,W.Va. W6 .....4.20
Youngstown R2, U5, Y1.3.90
PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.70
Geneva, Utah C11 .....5.05
PLATES, Wrought Iron
(Add 4.7% to base, extras)
Economy,Pa. B14 ....8.60
BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.95
Aliquippa,Pa. J5 .....3.95
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....3.95
Buffalo R2 .....3.95
Canton,O. R2 .....3.95
Clairton,Pa. U5 .....3.95
Cleveland R2 .....3.95
Detroit R7 .....4.10
Ecorse,Mich. G5 .....4.30
Emeryville,Calif. J7 ....4.70
Fairfield,Ala. T2 .....3.95
Fontana,Calif. K1 .....4.65
Gary,Ind. U5 .....3.95
Houston S5 .....4.35
Ind.Harbor,Ind. I-2, Y1.3.95
Johnstown,Pa. B2 .....3.95
KansasCity,Mo. S5 ....4.55
Lackawanna,N.Y. B2 ..3.95
LosAngeles B3 .....4.65
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.40
Niles,Calif. P1 .....4.65
N.Tonawanda,N.Y. B11.3.95
Pittsburg,Calif. C11 ....4.65
Pittsburgh J5 .....3.95
Portland,Oreg. O4 .....4.70
Seattle B3, N14, S24 ..4.70
So.ChicagoR2,U5,W14 ..3.95
So.Duquesne,Pa. U5 ...3.95
So.SanFran.,Calif. B3...4.70
Sterling,Ill. N15 .....4.55
Struthers,O. Y1 .....3.95
Torrance,Calif. C11 ....4.65
Weirton,W.Va. W6 ....4.10
Youngstown R2, U5 ....3.95
BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.925
Gary,Ind. U5 .....4.925
Youngstown U5 .....4.925

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.95
Atlanta, A11 .....4.50
Niles,Calif. P1 .....4.65
SanFrancisco S7 .....5.00
BAR SIZE ANGLES;H.R.CARBON
Bethlehem,Pa. B2 ....4.15
BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2.....4.675
Buffalo R2 .....4.675
Canton,O. T7 .....4.72
Canton,O. R2 .....4.675
Clairton,Pa. U5 .....4.675
Detroit R7 .....4.825
Ecorse,Mich. G5 .....5.025
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....4.675
Houston S5 .....5.075
Ind.Harbor,Ind. I-2, Y1.4.675
Johnstown,Pa. B2 ....4.675
KansasCity,Mo. S5 ....5.275
Lackawanna,N.Y. B2..4.675
LosAngeles B3 .....5.725
Massillon,O. R2 .....4.675
Midland,Pa. C18 .....4.675
So.Chicago R2,U5,W14.4.675
So.Duquesne,Pa. U5 ..4.675
Struthers,O. Y1 .....4.675
Warren,O. C17 .....4.675
Youngstown U5 .....4.675
BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.925
Bessemer,Ala. T2 ....5.925
Bethlehem,Pa. B2 .....5.925
Clairton,Pa. U5 .....5.925
Cleveland R2 .....5.925
Ecorse,Mich G5 .....6.675
Fairfield,Ala. T2 ....5.925
Fontana,Calif. K1 ....6.975
Gary,Ind. U5 .....5.925
Ind.Harbor,Ind. I-2 ...5.925
IndianaHarbor,Ind. Y1.6.425
Johnstown,Pa. B2 ....5.925
Lackawanna,N.Y. B2 ..5.925
LosAngeles B3 .....6.625
Pittsburgh J5 .....5.925
Seattle B3 .....6.675
So.Duquesne,Pa. U5 ..5.925
So.SanFrancisco B3 ...6.675
Struthers,O. Y1 .....6.425
Youngstown U5 .....5.925
BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ...4.925
BeaverFalls,Pa. R2 ...4.925
BeaverFalls,Pa. M12 ..4.925
Buffalo B5 .....4.975
Camden,N.J. P13 .....5.375
Carnegie,Pa. C12 .....4.925
Chicago B5 .....4.925
Chicago W18 .....4.925
Cleveland A7, C20 ....4.925
Detroit P17, R7 .....5.075
Detroit B5 .....5.125
Donora,Pa. A7 .....4.925
Elyria,O W8 .....4.925
FranklinPark,Ill. N5 ..4.925
Gary,Ind. R2 .....4.925
GreenBay,Wis. F7 ....4.925
Hammond,Ind L2,M13.4.925
Hartford,Conn. R2 ....5.475
LosAngeles R2 .....6.375
Mansfield,Mass. B5 ....5.475
Massillon,O. R2, R8 ..4.925
Monaca,Pa. S17 .....4.925
Newark,N.J. W18 ....5.375
Plymouth,Mich. P5 ....5.175
Pittsburgh J5 .....4.925
Putnam,Conn. W18 ...5.475
Readville,Mass. C14 ...5.475
St.Louis,Mo. M5 .....5.3
So.Chicago,Ill. W14 ...4.92
SpringCity,Pa. K3 ....5.37
Struthers,O. Y1 .....4.92
Waukegan,Ill. A7 .....4.92
Youngstown Y1 .....4.92
Youngstown F3 .....4.92
BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....6.0
BeaverFalls,Pa. M12 ..6.0
Bethlehem,Pa. B12 ....6.0
Buffalo B5 .....6.0
Camden,N.J. P13 .....6.4
Canton,O. R2 .....6.0
Canton,O. T7 .....5.9
Carnegie,Pa. C12 .....6.0
Chicago. B5 .....6.0
Chicago W18 .....6.0
Cleveland A7 .....6.0
Cleveland C20 .....6.0
Detroit P17, R7 .....6.1
Detroit B5 .....6.2
Donora,Pa. A7 .....6.0
Elyria,O. W8 .....6.0
Gary,Ind. R2 .....6.0
Hammond.Ind. L2,M13.6.0
Hartford,Conn. R2 .....6.4
Lackawanna,N.Y. B2 ..6.0
Mansfield,Mass B5 ....6.4
Massillon,O. R2,R8 ....6.0
Midland,Pa. C18 .....6.0
Monaca,Pa. S17 .....6.0
Newark,N.J. W18 .....6.3
Plymouth,Mich. P5 .....6.2
So.Chicago,Ill. R2, W14.6.0
SpringCity,Pa. K3 .....6.2
Struthers,O. Y1 .....6.0
Warren,O. C17 .....6.0
Waukegan,Ill. A7 .....6.0
Worcester,Mass, A7 ...6.3
Youngstown Y1 .....6.0
Youngstown F3 .....6.0
BARS, Reinforcing (Fabricator
AlabamaCity,Ala. R2 ...3.9
Atlanta A11 .....4.5
Buffalo R2 .....3.9
Cleveland R2 .....3.9
Emeryville,Calif. J7 ....4.7
Fairfield,Ala. T2 .....3.9
Fontana,Calif. K1 ....4.6
Gary,Ind. U5 .....3.9
Houston S5 .....4.3
Ind.Harbor,Ind. I-2, Y1.3.9
Johnstown,Pa. B2 .....3.9
KansasCity,Mo. S5 ....4.5
Lackawanna,N.Y. B2 ..3.9
LosAngeles B3 .....4.6
Milton,Pa. B6 .....4.5
Minnequa,Colo. C10 ....4.7
Niles,Calif. P1 .....4.
Pittsburg,Calif. C11 ....4.
Pittsburgh J5 .....3.
SandSprings,Okla. S5 ..4.
Seattle B3, N14, S24 ..4.
So.Chicago,Ill. R2 .....3.
So.Duquesne,Pa U5 .....3.
So.SanFrancisco B3 ....4.
SparrowsPoint,Md. B2 ..3.
Sterling,Ill. (1) N15 ....4.
Struthers,O. Y1 .....3.
Torrance,Calif C11 ...4.
Youngstown R2, U5 ...3.
BARS, Reinforcing (Fabricated; to consumers)
Huntington,W.Va. W7 ..5.
Johnstown, ¼-1" B2 ...5.
KansasCity S5 .....6.
LosAngeles B3 .....5.
Marion,O P11 .....5.

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel& Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Div., H. K. Porter Co.
B14 A. M. Byers Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wi
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lake Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire C
J1 Jackson Iron & Steel C
J3 Jessop Steel Co.
J4 Johnson Steel & Wire C
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metal
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

Seattle B3 N14 .....5.80
Sand Springs S5 .....6.45
So.SanFrancisco B3 ...5.45
SparrowsPt. ¼-1" B2 ..5.25
Williamsport,Pa. S19 ...5.35

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ...4.75
ChicagoHts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngt,W.Va.(3) W7 ..5.75
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....4.05
Tonawanda(3,4) B12 ..5.00
Williamsport(3) S19 ...5.25
Williamsport,Pa. S19 ...5.35

BARS, Wrought Iron
(Add 4.1% to base and extras)
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ..13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.775
Ashland,Ky.(8)A10 ...3.775
Butler,Pa. A10 .....3.775
Cleveland J5, R2 .....3.775
Conshohocken,Pa. A3 ..4.175
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.975
Fairfield,Ala. T2 .....3.775
Fontana,Calif. K1 ....4.325
Gary,Ind. U5 .....3.775
Geneva,Utah C11 ....3.875
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 .....3.775
Lackawanna,N.Y. B2 ..3.775
Munhall,Pa. U5 .....3.775
Niles,O. N12 .....5.425
Pittsburg,Calif. C11 ..4.475
Pittsburgh J5 .....3.775
Sharon,Pa. S3 .....4.175
So.Chicago,Ill. W14 ...3.775
SparrowsPoint,Md. B2.3.775
Steubenville,O. W10 ..3.775
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.775
Weirton,W.Va. W6 ....3.775
WestLeechburg,Pa. A4..3.925
Youngstown U5, Y1 ..3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.925
Dover,O. R1 .....5.825
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.675
Torrance,Calif. C11 ..5.575

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ....6.925
Ecorse,Mich. G5 .....7.475
Fontana,Calif. K1 ....7.975
Gary,Ind. U5 .....6.925
IndianaHarbor,Ind. Y1.7.425
IndianaHarbor,Ind. I-2.6.925
Irvin,Pa. U5 .....6.925
Lackawanna(37) B2 ..6.925
Pittsburgh J5 .....6.925
SparrowsPoint(38) B2..6.925
Warren,O. R2 .....6.925
Weirton,W.Va. W6 ....7.275
Youngstown Y1 .....7.425

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy
Cleveland J5, R2 ....5.675
Conshohocken,Pa. A3 ..5.925
Ecorse,Mich. G5 .....6.225
Fairfield,Ala. T2 ....5.675
Fontana,Calif. K1 ....6.775
Gary,Ind. U5 .....5.675
Ind.Harbor,Ind. I-2 ...5.675
Ind.Harbor,Ind. Y1 ...6.175
Irvin,Pa. U5 .....5.675
Lackawanna(35) B2 ..5.675
Munhall,Pa. U5 .....5.675
Pittsburgh J5 .....5.675
Sharon,Pa. S3 .....5.675
So.Chicago,Ill. U5 ....5.675
SparrowsPoint(36) B2..5.675
Warren,O. R2 .....5.675
Weirton,W.Va. W6 ....6.025
Youngstown U5 .....5.675
Youngstown Y1 .....6.175

SHEETS, Cold-Rolled Steel (Commercial Quality)
Butler,Pa. A10 .....4.575
Cleveland J5, R2 ....4.575
Ecorse,Mich. G5 .....4.775
Fairfield,Ala. T2 ....4.575
Follansbee,W.Va. F4 ..5.575
Fontana,Calif. K1 ....5.675
Gary,Ind. U5 .....4.575
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2,Y1.4.575
Irvin,Pa. U5 .....4.575
Lackawanna,N.Y. B2 ..4.575
Middletown,O. A10 ....4.575
Pittsburg,Calif. C11 ...5.525
Pittsburgh J5 .....4.575
SparrowsPoint,Md. B2..4.575
Steubenville,O. W10 ...4.575
Warren,O. R2 .....4.575
Weirton,W.Va. W6 ....4.575
WestLeechburg,Pa. A4..5.45
Youngstown Y1 .....4.575

SHEETS, Galv'd No. 10 Steel
AlabamaCity,Ala. R2 ..5.075
Ashland,Ky.(8) A10 ..5.075
Canton,O. R2 .....5.075
Delphos,O. N16 .....5.675
Dover,O. R1 .....5.775
Fairfield,Ala. T2 .....5.075
Gary,Ind. U5 .....5.075
GraniteCity,Ill. G4 ....5.275
Ind.Harbor,Ind. I-2 ...5.075
Irvin,Pa. U5 .....5.075
Kokomo,Ind.(13) C16 ..5.475
MartinsFerry,O. W10 ..5.075
Niles,O. N12 .....6.275
Pittsburg,Calif. C11 ...5.825
SparrowsPoint,Md. B2 .5.075
Steubenville,O. W10 ...5.075
Torrance,Calif. C11 ...5.825
Weirton,W.Va. W6 ....5.075

SHEETS, Galvanized No. 10, High-Strength Low-Alloy
Irvin,Pa. U5 .....7.625
SparrowsPoint(39) B2..7.775

SHEETS, Galvannealed Steel
Canton,O. R2 .....5.625
Irvin,Pa. U5 .....5.625
Kokomo,Ind.(13) C16 ..6.025
Niles,O. N12 .....6.825

SHEETS ZINCGRIP STEEL No. 10
Butler,Pa. A10 .....5.325
Middletown,O. A10 ....5.325

SHEETS, Electro Galvanized
Cleveland R2 (28) 5.925
Niles,O. R2 (28) 5.925
Weirton,W.Va. W6 ....5.775

SHEETS, Well Casing
Fontana,Calif. K1 .....5.34

BLUED Stock, 29 ga.
Yorkville,O. W10 .....7.00
Follansbee,W.Va. F4 ...7.10
Follansbee (23) F4 ....6.425

SHEETS, Enameling Iron
Ashland,Ky.(8) A10 ..4.925
Cleveland R2 .....4.925
Gary,Ind. U5 .....4.925
GraniteCity,Ill. G4 ....5.625
Ind.Harbor,Ind. I-2 ...4.925
Irvin,Pa. U5 .....4.925
Middletown,O. A10 ....4.925
Youngstown Y1 .....4.925

BLACK PLATE (Base Box)
Aliqu.ppa,Pa. J5 .....$6.50
Fairfield,Ala. T2 .....6.60
Gary,Ind. U5 .....6.50
GraniteCity,Ill. G4 ....6.70
Ind.Harbor,Ind. I-2, Y1.6.50
Irvin,Pa. U5 .....6.50
Niles,O. R2 .....6.50
Pittsburg,Calif. C11 ....7.25
SparrowsPoint,Md. B2 ..6.60
Warren,O. R2 .....6.50
Weirton,W.Va. W6 ....6.50
Yorkville,O. W10 .....6.50

HOLLOWARE ENAMELING Black Plate (29 gage)
Follansbee,W.Va. F4 ...6.10
Gary,Ind. U5 .....6.10
GraniteCity,Ill. G4 ....6.30
Ind.Harbor,Ind. Y1 ....6.10
Irvin,Pa. U5 .....6.10
Yorkville,O. W10 .....6.35

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.875	....
Canton,O. R2 ..	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5 ...	5.875	6.125
Ind.Harbor I-2 .	5.875	6.125
Irvin,Pa. U5 ...	5.875	6.125
Kokomo,Ind. C16	6.525	....
MartinsFy.,O.W10	5.875	....
Pittsburg,Cal.C11	6.625	....
SparrowsPt. B2.	5.875	....
Torrance,Cal.C11	6.625	....

SHEETS, Culvert, No. 16 Pure Iron
Ashland,Ky. A10 .....6.125
Fairfield,Ala. T2 .....6.125
MartinsFerry,O. W10 ..6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier
Ashland,Ky.(8) A10 ..4.025
Cleveland R2 .....4.375
Ind.Harbor,Ind. I-2 ...4.025
Warren,O. R2 .....4.375

SHEETS, Cold-Rolled Ingot Iron
Butler,Pa. A10 .....5.075
Cleveland R2 .....5.175
Middletown,O. A10 ....5.075
Warren,O. R2 .....5.175

SHEETS, Galvanized Ingot Iron No. 10 flat
Ashland,Ky.(8) A10 ...5.325
Canton,O. R2 .....5.825

SHEETS, ZINCGRIP Ingot Iron
Butler,Pa. A10 .....5.575
Middletown,O. A10 ....5.575

SHEETS, ALUMINIZED
Butler,Pa. A10 .....8.425

SHEETS, Long Terne, Ingot Iron
Middletown,O. A10 ....5.875

MANUFACTURING TERNES (Special Coated)
Fairfield,Ala. T2 .....$7.85
Gary,Ind. U5 .....7.75
Irvin,Pa. U5 .....7.75
Yorkville,O. W10 .....7.75

SHEETS, LT. Coated Ternes, 6 lb
Yorkville,O. W10 ....$8.65

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)
Gary,Ind. U5 .....$9.75
Yorkville,O. W10 .....9.75

SHEETS, Long Terne Steel (Commercial Quality)
BeechBottom,W.Va.W10 5.475
Gary,Ind. U5 .....5.475
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....5.475
Niles,O. N12 .....6.275
Weirton,W.Va. W6 ....5.475

ROOFING SHORT TERNES (8 lb Coated)
Gary,Ind. U5 .....9.75

TIN PLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2.	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1.	8.70	8.95
Irvin,Pa. U5 ...	8.70	8.95
Pitts.,Cal. C11 ..	9.45	9.70
Sp.Pt.,Md. B2 ..	8.80	9.05
Warren,O. R2 ..	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10.	8.70	8.95

STRIP, Hot-Rolled High-Strength Low-Alloy
Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3....5.90
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 ....6.75
Gary,Ind. U5 .....5.65
Ind.Harbor,Ind. I-2.....5.65
Ind.Harbor,Ind. Y1 ....6.15
Lackawanna,N.Y. B2 ..5.70
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.65
So.SanFrancisco(25) B3.6.40
SparrowsPoint,Md. B2..5.70
Warren,O. R2 .....5.65
Weirton,W.Va. W6 ....6.10
Youngstown Y1 .....6.15
Youngstown U5 .....5.65

STRIP, Cold-Rolled High-Strength Low-Alloy
Cleveland J5 .....7.45
Cleveland A7 .....7.30
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.15
Lackawanna,N.Y. B2 ..7.90
Sharon,Pa. S3 .....7.30
SparrowsPoint,Md. B2 .7.90
Warren,O. R2 .....7.30
Weirton,W.Va. W6 ....7.95
Youngstown Y1 .....7.80

STRIP, Cold-Rolled Alloy Steel
Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....11.40
Dover,O. G6 .....11.90
Fontana,Calif. K1 .....13.30
Harrison,N.J. C18 .....12.00
Midland,Pa. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) N8 12.15
Pawtucket,R.I.(12) N8.12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...11.70
Youngstown C8 .....12.00

STRIP, Hot-Rolled Ingot Iron
Ashland,Ky.(8) A10 ..3.975
Warren,O. R2 .....4.325

STRIP, Cold-Rolled Ingot Iron
Warren,O. R2 .....5.70

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	...	...
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.85	9.10	9.90
Brackenridge,Pa. A4	...	...	8.35	9.60	10.40
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	7.55	7.85	(34)	(41)	...
Mansfield,O. E6 (cut lengths)	7.20	7.35	7.85	9.10	9.90
Newport,Ky. N9 (cut lengths)	...	7.35	7.85	9.10	9.90
Niles,O. N12 (cut lengths)	..	7.05	7.35	7.85	...
Vandergrift,Pa. U5	...	...	7.85	8.35	9.60 10.40
Warren,O. R2	7.55	7.85	8.35	9.60	10.40
Zanesville,O. A10	...	7.85	8.35	9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95	....	....	....
Newport,Ky. N9 (cut lengths)	10.45	....	....	....
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95	....	....	....
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	....	15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1	...	...	8.55	10.50	....
Carnegie,Pa. S18	...	7.65	8.25	10.30	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50	....	....
Detroit D2	6.45	7.50	8.10	....	....
Dover,O. G6	5.70	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18	...	...	8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	....
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20	....	....
NewYork W3	...	7.95	8.55	10.50	12.80
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	7.65	8.25	10.20	12.50
Worcester,Mass.,Base.	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5	...	7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8	...	7.65	8.25	10.20	12.50
Spring Steel (Tempered)					
Trenton,N.J. R5 (29)	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30*	12.50*	15.35*
Youngstown C8	...	...	10.30	12.50	15.35

* Plus $1.575 per 100 lb.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Div.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S24 Seidelhuber Steel

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.

U4 Universal Cyclops Steel
U5 United States Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2...3.725
Alton,Ill. L1 .....4.20
Ashland,Ky(8) A10 ..3.725
Atlanta A11 .....4.275
Bessemer,Ala. T2 ....3.725
Bridgeport,Con.(10)S15 4.225
Buffalo(27) R2 .....3.725
Butler,Pa. A10 .....3.725
Carnegie,Pa. S18 ....4.225
Conshohocken,Pa. A3 ..4.125
Detroit M1 .....4.40
Ecorse,Mich. G5 ....4.025
Fairfield,Ala. T2 ....3.725
Fontana,Calif. K1 ....5.175
Gary,Ind. U5 .....3.725
Houston,Tex. S5 .....4.125
Ind.Harbor,Ind. I-2,Y1.3.725
Johnstown,Pa.(25) B2..3.725
KansasCity,Mo.(9) S5..4.325
Lackw'na,N.Y.(32) B2 3.725
LosAngeles(25) B3 ....4.475
Milton,Pa. B6 .....4.35
Minnequa,Colo. C10 ...4.775
NewBritain(10) S15 ...4.225
N.Tonawanda,N.Y.B11 3.725
Pittsburg,Calf. C11 ...4.475
Riverdale,Ill. A1 .....3.725
SanFrancisco S7 .....5.00
Seattle(25) B3 .....4.725
Seattle N14 .....4.725
Sharon,Pa. S3 .....4.225
So.Chicago, Ill. W14 ...3.725
So.SanFrancisco(25) B3 4.475
SparrowsPoint,Md. B2.3.725
Sterling,Ill. N15 .....4.725
Torrance,Calif. C11 ...4.475
Warren,O. R2 .....3.725
Weirton,W.Va. W6 ....3.825
WestLeechburg,Pa. A4.3.975
Youngstown U5, Y1 ...3.725

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15.6.05
Carnegie,Pa. S18 .....6.45
Fontana,Calif. K1 .....7.50
Gary, Ind. U5 .....6.10
Houston,Tex. S5 .....6.50
KansasCity, Mo. S5 ....6.70
Midland,Pa. C18 .....5.85
NewBritn.,Conn.(10)S15 6.05
Sharon,Pa. S3 .....6.45
Youngstown U5 .....6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ..5.50
Bridgeprt,Conn.(10) S15.5.80
Butler,Pa. A10 .....5.10
Cleveland A7, J5 .....5.10
Dearborn,Mich. D3 .....6.05
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.50
Ecorse,Mich. G5 .....5.30
Follansbee,W.Va. F4 ...5.10
Fontana,Calif. K1 .....7.00
FranklinPark,Ill.(40)T6 .5.35
Ind.Harbor,Ind. I-2 ....5.35
Lackawanna,N.Y. B2 ..5.10
LosAngeles C1 .....7.15
Mattapan,Mass. T6 ....5.95
Middletown,O. A10 ....5.10
NewBritain(10) S15 ....5.80
NewCastle,Pa. B4 .....5.80
NewCastle,Pa.(40) E5 ..5.70
NewHaven,Conn. D2 ...5.85
NewHaven,Conn. A7 ...5.60
Pawtucket,R.I. R3 ....6.45
Pawtucket,R.I.(21) N8.6.30
Riverdale,Ill.(40) A1 ...5.35
Rome,N.Y. R6 .....5.10
Sharon,Pa. S3 .....5.80
SparrowsPoint,Md. B2 .5.10
Trenton,N.J. R5 .....6.45
Wallingford,Conn. W2 ..6.30
Warren,O.(40) T5 .....5.70
Warren,O. R2 .....5.10
Weirton,W.Va. W6 .....5.10
Youngstown C8 .....5.70
Youngstown Y1 .....5.10

STRIP, Electro Galvanized

Dover, O. G6 .....5.50
Warren,O. T5 .....5.70
Weirton,W.Va. W6 ....5.10
Youngstown C8 .....5.70

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.45
Riverdale,Ill. A1 .....4.30
Sharon,Pa. S3 .....4.55
Youngstown U5 .....4.15

ROPE WIRE

Alton,Ill. L1 (43) 8.75
Bartonville,Ill. K4 .....8.95
Buffalo W12 (43) 8.55
Fostoria,O. S1 (43) 8.85
Johnstown,Pa. B2 (43).8.55
Monessen,Pa. P16 (43)..8.55
Monessen,Pa. P7 (43) ..8.80
Muncie,Ind. I-7 (43) ...8.75
Palmer,Mass. W12 (43).8.85
Portsmouth,O. P12 (43).8.55
Roebling,N.J. R5 (43) ..8.85
SparrowsPt. B2 (43) ...8.65
Struthers,O. Y1 (43) ...8.55
Worcester J4, T6 (43) ..8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Merchant Quality

(6 to 8 gage)	An'ld.	Galv.
AlabamaCity R2..	6.075	6.325
Aliquippa J5 ...	6.075	6.525‡
Atlanta A11	6.325	6.675
Bartonville(19)K4	6.075	6.40
Buffalo W12	5.225	....
Cleveland A7	6.075	6.225
CrawfordsvilleM8	6.175	6.475
Donora,Pa. A7 ..	6.075	6.225
Duluth,Minn. A7.	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5..	6.475	6.80
Johnstown B2 ...	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy.Mo. S5.	6.675	7.00
Kokomo C16	6.175	6.425
LosAngeles B3 ..	7.025	....
Minnequa C10 ...	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	5.525	....
Pitts.,Calif. C11..	7.025	7.175
Prtsmth.(18)P12..	6.475	....
Rankin A7	6.075	6.225
So.Chicago R2 ..	6.075	6.325
So.S.Fran. C10 ..	7.025	7.40*
SparrowsPt. B2 ..	6.175	6.55†
Sterling,Ill.(1)N15	*6.375*	*6.925*
Struthers,O. Y1 ..	6.075	6.475
Torrance,Cal. C11	7.025	....
Worcester A7 ...	6.375	6.525

*Based on 14c zinc; †14.50c zinc; ‡17.5c zinc.

WIRE (16 gage) (Add 4.7% on base and extras)	An'l'd. Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(19)K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfordsville M8.	10.73	12.51
Fostoria,O. S1 ..	10.40	13.00
Johnstown B2 ..	10.73	12.58§
Kokomo C16.	10.625†	12.325§
Minnequa C10..	10.40	12.425*
Palmer,Mass. W12.	10.25	12.15
Pitts.,Cal. C11 ..	10.60	11.90
SparrowsPt. B2 .	10.84	12.68§
Sterling(1) N15	10.73†	12.15†
Waukegan A7	10.25	11.55
Worcester A7		11.85

*Based on 14c zinc; $14.50c zinc. †Includes 4.7% increase.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2..5.225
Aliquippa,Pa. J5 (42)...4.85
Atlanta A11 .....5.475
Alton, Ill. L1 .....5.45
Bartonville,Ill. K4 ....5.325
Buffalo W12 .....5.225
Chicago W13 .....5.475
Cleveland A7, C20 ....5.225
Crawfordsville,Ind. M8.5.325
Donora,Pa. A7 .....5.225
Duluth,Minn. A7 .....5.225
Fairfield,Ala. T2 .....5.225
Fostoria,O. (24) S1 ...5.725
Houston S5 .....5.625
Johnstown,Pa. B2 ....5.225
Joliet,Ill. A7 .....5.225
KansasCity,Mo. S5 ....5.825
Kokomo,Ind. C16 .....5.325
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.475
Monessen,Pa. P7 .....5.475
Newark 6-8 ga I-1 ....5.88
No.Tonawanda B11 ...5.225
Palmer,Mass. W12 ....5.525
Pittsburg,Calif. C11 ...6.175
Portsmouth,O. P12 ....5.625
Rankin,Pa. A7 .....5.225
So.Chicago, Ill. R2 ....5.225
So.SanFrancisco C10 ..6.175
SparrowsPoint,Md. B2..5.325
Sterling,Ill.(1) N15 ...5.225
Struthers,O. Y1 .....5.225
Torrance,Calif. C11 ...6.175
Waukegan,Ill. A7 .....5.225
Worcester,Mass. A7 ...5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 (43) 6.35
Cleveland A7 (43) 5.85
Crawfs-ville,Ind.M8(43) 5.70
Dover,O. G6 .....6.20
Fostoria,O. S1 (43) 6.00
Kokomo,Ind. C16 (43)..5.70
FranklinPark,Ill. T6(43) 6.20
Massillon,O. R8 (43) ...5.85
Monessen,Pa. P16 (43)..6.35
Monessen,Pa. P7 (43) ..6.10
Pawtkt,R.I.(12) N8 (43)6.85
Trenton,N.J. R5 (43) ...6.15
Worcester,Mass.A7 (43).6.15
Worcester,Mass.T6 (43).6.50
Worcester,Mass.W12(43) 6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....8.90
Monessen,Pa. P16 (43)..8.50
Muncie,Ind. I-7 (43) ...8.70
Roebling,N.J. R5 (43) ..8.80
SparrowsPt.,Md. B2(43).8.60
Johnstown,Pa. B2 (43)..8.50

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43) ..6.25
Alton,Ill. L1 (43) 6.55
Bartonville,Ill. K4 .....6.64
Buffalo W12 (43) 6.25
Cleveland A7 (43) 6.25
Donora,Pa. A7 (43) 6.25
Duluth,Minn. A7 (43) ..6.25
Fostoria,O. S1 (43) 6.25
Johnstown,Pa. B2 (43)..6.25
Millbury(12) N6 (43)...8.05
Minnequa,Colo. C10(43).6.50
Monessen,Pa. P7 (43) ..6.25
Monessen,Pa. P16 .....6.75
Muncie,Ind. I-7 (43) ...6.45
Palmer,Mass. W12 (43) 6.55
Pittsburg,Calif. C11(43.7.20
Roebling,N.J. R5 (43)..6.55
Portsmouth,O. P12(43)..6.25
So.Chicago,Ill. R2 (43)..6.25
So.SanFran. C10 (43) ..7.20
SparrowsPt.,Md. B2 (43)6.35
Struthers,O. Y1 (43) 6.25
Trenton,N.J. A7 (43) ...6.55
Waukegan,Ill. A7 (43)..6.25
Worcester A7, T6 (43)..6.55
Worcester,Mass. W12(43)6.55
Worcester,Mass. J4 (43).6.75

WIRE Upholstery Spring

Aliquippa,Pa. J5 .....6.275
Alton,Ill. L1 .....6.50
Buffalo W12 .....6.275
Cleveland A7 .....6.275
Donora,Pa. A7 .....6.275
Duluth,Minn. A7 .....6.275
Johnstown,Pa. B2 .....6.275
LosAngeles B3 .....7.225
Minnequa,Colo. C10 ...6.525
Monessen,Pa. P7 .....6.275
Monessen,Pa. P16(42) ..6.40
NewHaven,Conn. A7 ..6.575
Palmer,Mass. W12 ....6.575
Pittsburg,Calif. C11 ..7.225
Portsmouth,O. P12 ...6.275
Roebling,N.J. R5 .....6.575
So.Chicago,Ill. R2 ....6.275
So.SanFrancisco C10 ..7.225
SparrowsPoint,Md. B2..6.375
Torrance,Calif. C11 ..7.225
Trenton,N.J. A7 .....6.575
Waukegan,Ill. A7 .....6.275
Worcester,Mass. A7 ..6.575

WIRE, Fine & Weaving (8"Coils)

Alton,Ill. L1 (43) 9.20
Bartonville,Ill. K4 ....9.42
Buffalo W12 (43) 8.90
Chicago W13 .....9.32
Cleveland A7 (43) 8.90
Crawf'sville,Ind. M8(43) 8.90
Fostoria,O. S1 (43) 8.90
Johnstown,Pa. B2 (43)..8.90
Kokomo,Ind. C16 (43)..8.90
Monessen,Pa. P16 (43)..8.90
Muncie,Ind. I-7 (43) ...9.10
Palmer,Mass. W12 (43).9.20
Roebling,N.J. R5 (43) ..9.20
Waukegan,Ill. A7 (43)..8.90
Worcstr.Mass. A7,T6(43)9.20

WIRE, Tire Bead

Bartonville,Ill. K4 ....11.51
Monessen,Pa. P16 (43).11.40
Roebling,N.J. R5 (43).11.55

WOVEN FENCE, 9-15½ Ga. Col

AlabamaCity,Ala. R2 ...135
Ala.City,Ala.,17-18ga.R2 222
Aliqu'pa,Pa.9-14½ga.J5 139‡
Atlanta A11 140
Bartonville,Ill.(19) K4 ..137
Crawfordsville,Ind. M8 ..138
Donora,Pa. A7 133
Duluth,Minn. A7 133
Fairfield,Ala. T2 133
Houston,Tex. S5 145
Johnstown,Pa. B2 138
Johnstown 17ga.,6" B2 .229
Joliet,Ill. A7 133
KansasCity,Mo. S5 149
Kokomo,Ind. C16 140
Minnequa,Colo. C10 ....146*
Monessen,Pa. P7 138
Pittsburg,Calif. C11 156
Rankin,Pa. A7 133
So.Chicago,Ill. R2 135
Sterling,Ill. (1) N15 136

*On 14c zinc; ‡17.5c zinc.

FENCE POSTS	Col.
ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. F5	140
Huntington,W.Va. W7	..148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	...158

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	...144
Aliquippa,Pa. J5	.....148‡
Atlanta A11	149
Bartonville,Ill.(19) K4	..146
Crawfordsville,Ind. M8	..147
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	154
Johnstown,Pa. B2	145
Joliet,Ill. A7	142
KansasCity,Mo. S5	158
Kokomo,Ind. C16	149
Minnequa,Colo. C10	....153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	..162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10.	.167*
SparrowsPoint,Md. B2	..147
Sterling,Ill.(1) N15	145

*On 14c zinc; ‡17.5c zinc.

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	...132
Atlanta A11	135
Bartonville,Ill.(19) K4	..132
Crawfordsville,Ind. M8	..132
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	..156
SparrowsPoint,Md. B2	..134
Sterling,Ill.(1) N15	132

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	...127
Aliquippa,Pa. J5	127
Atlanta A11	130
Bartonville,Ill. (19) K4	..127
Chicago,Ill. W13	127
Cleveland A9 (44)	125
Crawfordsville,Ind. M8	..127
Donora,Pa. A7	127
Duluth,Minn. A7	127
Fairfield,Ala. T2	127
Galveston,Tex. D7	135
Houston,Tex. S5	135
Johnstown,Pa. B2	127
Joliet,Ill. A7	127
KansasCity,Mo. S5	139
Kokomo,Ind. C16	129
Minnequa,Colo. C10 (44)	.123
Monessen,Pa. P7	127
Pittsburg,Calif. C11	146
Portsmouth,O. P12	132
Rankin,Pa. A7	127
So.Chicago,Ill. R2	127
SparrowsPt.Md. B2	129
Sterling,Ill.(1) N15	127
Torrance,Calif. C11	147
Worcester,Mass. A7	133

NAILS, Cut (100 lb keg) to dealers (33)

Conshohocken,Pa. A3 ..$7.80
Wheeling,W.Va. W10 ...7.80

STAPLES, Polished, Stock

To dealers & mfrs. (7)	Co
AlabamaCity,Ala. R2	...12
Aliquippa,Pa. J5	12
Atlanta A11	12
Bartonville,Ill. (19) K4.	.12
Chicago W13	12
Crawfordsville,Ind. M8	..12
Donora,Pa. A7	12
Duluth,Minn. A7	12
Fairfield,Ala. T2	12
Johnstown,Pa. B2	12
Joliet,Ill. A7	12
Kokomo,Ind. C16	12
Minnequa,Colo. C10 (45)	.12
Monessen,Pa. P7	12
Pittsburg,Calif. C11	14
Portsmouth,O. P12	13
Rankin,Pa. A7	12
So.Chicago,Ill. R2	12
SparrowsPt.,Md. B2	12
Sterling,Ill.(1) N15	12
Torrance,Calif. C11	14
Worcester,Mass. A7	13

TRACK BOLTS (20) Treated

KansasCity,Mo. S5(46)..9.8
Lebanon,Pa. (31) B2 ...9.8
Minnequa,Colo. C10 ....9.8
Pittsburgh P14 .....9.8
Pittsburgh O3 .....10.6

AXLES

Ind.Harbor,Ind. S13 ....5.6
Johnstown,Pa. B2 .....5.6

TIE PLATES

Fairfield,Ala. T2 .....4.92
Gary,Ind. U5 .....4.92
Ind.Harbor,Ind. I-2 ...4.92
Lackawanna,N.Y. B2 ..4.77
Minnequa,Colo. C10 ...4.92
Pittsburgh,Calif. C11 ..5.07
Seattle B3 .....5.07
Steelton,Pa. B2 .....4.77
Torrance,Calif. C11 ...5.07

JOINT BARS

Bessemer,Pa. U5 .....5.07
Fairfield,Ala. T2 .....5.07
Ind.Harbor,Ind. I-2 ..5.07
Joliet,Ill. U5 .....5.07
Lackawanna,N.Y. B2..4.92
Minnequa,Colo. C10 ...5.0
Steelton,Pa. B2 .....4.92

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2 ....6.8
Ind.Harbor,Ind. Y1 ....6.6
KansasCity, Mo. S5 ....6.9
Lebanon,Pa. B2 .....6.6
Minnequa,Colo. C10 ....6.8
Pittsburgh J5 .....6.6
Seattle B3 .....7.1
So.Chicago, Ill. R2 ....6.6
Struthers,O. Y1 .....6.6
Youngstown R2 .....6.6

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Std. Tee Rail 60 lb Under
Bessemer,Pa. U5	*4.075*	*3.975*	*4.025*	*5.0*
Ensley,Ala. T2	*4.075*	*3.975*	....	*5.0*
Fairfield,Ala. T2	....	....	....	*5.0*
Gary,Ind. U5	*4.075*	*3.975*	*4.025*	..
Huntington,W.Va. W7	....	....	....	5.2
IndianaHarbor,Ind. I-2	4.075	3.975	4.025	..
Johnstown,Pa. B2	....	....	...(16)	4.2
Lackawanna,N.Y. B2	3.775	3.675	....	4.2
Minnequa,Colo. C10	$81.50*	$79.50*	....	4.7
Steelton,Pa. B2	3.775	3.675	....	..
Williamsport,Pa. S19	....	....	....	5.0

*Per net ton.

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3.25	0.5	....	1.01

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

FOOTNOTES

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base
(13) Add 0.50c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated
(21) New Haven, Conn., base
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators to consumers, 5.05c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $31.50 per ton.
(30) Sheared; add 0.35c fo universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c
(34) 7.85c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60 & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb
(43) Plus 4.7% on base an extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.
(46) Plus 2.2 per cent.

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	½		¾		1		1¼		1½		2		2½		3	
List Per Ft.	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c	
Pounds Per Ft.	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	32.5	15.25	35.5	18.25	38	20.75	38.5	20.5	39	21	39.5	21.5	40	21.25	40	21.25
Alton, Ill. L1 (†)	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75
Etna, Pa. N2 (†)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75
Fontana, Calif. K1 (†)	19.5	0.25	22.5	4.25	25	7.75	25.5	7.5	26	8.5	26.5	9	27	8.75	27	8.75
Ind. Harbor, Ind. Y1 (†)	31.5	14.25	34.5	18.25	37	21.75	37.5	21	38	22	38.5	22.25	39	21.75	39	21.75
Lorain, O. N3 (*)	32.5	22.25	35.5	26.25	38	29.75	38.5	27.25	39	28.25	39.5	28.75	40	26.25	40	26.25
Sharon, Pa. M6	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25
Sparrows Pt., Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75
Youngstown R2 (**)	32.5	16.25	35.5	20.25	38	23.75	38.5	22.75	39	23.75	39.5	24.25	40	23.25	40	23.25
Youngstown Y1 (‡)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (*)	24	12.75	27	12.75	27	12.75	29	14.75	29	14.75	33.75	19.5	33.75	19.5
Youngstown Y1 (‡)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown, R2 (**)	24	8.25	27	9.75	27	9.75	29	11.75	29	11.75	33.75	16.5	33.75	16.5

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		3½		4	
List Per Ft	5.5c		6c		6c		92c		$1.09	
Pounds Per Ft	0.24		0.42		0.57		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25
Butler, Pa. F6 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....
Etna, Pa. N2 (†)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25
Sharon, Pa. M6 (‡)	29.5	−1.75	23	+2.25	18	+5.25	..	....	..	....
Sharon, Pa. S4 (†)	30.5	1.25	25	+1.75	20	+5.5	..	....	..	....
Sparrows Pt., Md. B2	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....
Youngstown R2 (**)	....	....	....	....	....	....	33	15.75	33	15.75
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	..	....	..	....

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 12.50c; (**), 11.50c; (*), 5c, with discounts adjusted depending on price of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft., inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	14.19	16.71–17.77	16.20	16.20
1¼	13	16.97	19.80–21.26	16.46	19.19
1½	13	18.22–18.77	22.08–22.82	18.19	21.41
1¾	13	20.35–21.35	24.92–25.49	20.69	24.35
2	13	22.81–23.93	27.94–28.58	23.19	27.28
2¼	13	25.69–26.66	31.38–32.18	25.84	30.42
2½	12	28.40–29.36	34.55–35.58	28.46	33.50
2¾	12	31.28–32.17	37.83–39.19	31.19	36.67
2¾	12	33.87–34.82	40.09–42.44	33.05	38.86
3	12	35.78–36.87	42.11–44.93	34.98	40.82

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	11
⅝-in. & ⅞-in.	15
1-in. and larger	14
Longer than 6 in.:	
All diams.	8
Lag bolts, all diams.:	
6 in. and shorter	19
over 6 in. long	16
Ribbed Necked Carriage	15
Blank	30
Plow	30
Step, Elevator, Tap and Sleigh Shoe	18
Tire Bolts	8
Boiler & Fitting-Up Bolts	28

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	10	10
⅝-in. & ⅞-in.	8	1
1-in.-1½-in.	4	+4
1⅝-in. & larger	22	1
H.P. Hex.:		
½-in. & smaller	12	+3
⅝-in. & ⅞-in.	8	+3
1-in.-1½-in.	4	+3
1⅝-in. & larger	4	+3
C.P. Hex.:		
½-in. & smaller	22	18
⅝-in. & ⅞-in.	19	13
1-in. & 1½-in.	15	8
1⅝-in. & larger	2	+4

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	33	26
⅝-in. & ⅞-in.	27	19
1-in.-1½-in.	21	11
1⅝-in. & larger	5	list
		Light
7/16-in. & smaller	33	
½-in. to ⅝-in.		26
¾-in. to 1½-in.		18

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	37
1 in. and smaller diam. x over 6 in.	24

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼-in. diam & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	40
¾-in. through 1 in.	26
Longer than 6 in.:	
⅝-in. and smaller	24
¾-in. through 1 in.	2

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh; f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.50c

7/16-in. under .....40 off

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Inches Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l.f. N.Y., c.l., in bags	10.90
Electrolytic iron:	
Annealed, 99.5% Fe.	42.50
Unannealed (99+ % Fe)	36.50
Unannealed (99+ % Fe) (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	34.00
Antimony, 500 lb lots.	78.00
Brass, 20-ton lots.	30.00-39.00
Bronze, 10-ton lots	52.25-60.00
Copper:	
Electrolytic	45.75
Reduced	12.75*
Lead	7.50*
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	48.50
Silicon	38.50
Solder	8.50*
Stainless Steel, 302	87.00
Zinc, 10-ton lots.	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium, electrolytic 99.9% Cr min.	3.50

* Plus cost of metal.

STAINLESS STEEL

(Add 4.7% to extras where new extra cards have not been issued)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	44.25	36.50	33.75
302	44.50	39.75	34.00
303	46.50	43.50	36.50
304	46.50	41.75	35.50
309	60.50	59.25	48.25
316	61.50	63.50	53.00
321	53.00	52.00	40.00
347	58.00	56.50	44.75
410	39.00	32.75	27.50
416	40.00	40.00	28.00
420	47.00	50.25	33.50
430	41.50	33.25	28.00
501	29.25	27.75	15.25

Balt., Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa. sheets and strip except Types 303, 309, 416 420, 501 & 502 A10

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Harrison, N. J., wire, Type 302, 33.00c; Type 304, 34.50c; Type 316, 51.50c, including 4.7% increase.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501 502 and 34.25c on Type 301 S3.

So. Chicago, bars, shapes U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, strip A4.

Youngstown, strip C8.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

Cladding Stainless	Plates Carbon Base 10%	Plates Carbon Base 20%	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Copper Base Both Sides
302	....	....	19.75	26.24-27.50	77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00	....	....	....
310	36.50	41.00	....	....	144.00
316	29.50	34.00	26.00	35.92-36.50	....
317	34.50	39.00	....	....	....
318	33.50	38.00	....	....	....
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75	....	....	....
410	20.75	27.25	....	....	....
Nickel	33.55	45.15	....	....	....
Inconel	41.23	54.18	....	....	165.00
Monel	34.93	46.28	....	....	....
Copper*	....	....	....	44.00	....

Strip — Carbon Base

	Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Nickel	41.00	54.00	....	....
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatsville L7; nickel. copper-clad strip. Carnegie, Pa. S18 Production point for copper-base sheets is Carnegie, Pa. A13.

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except: New York, 3 cents; Philadelphia, 25 cents; Birmingham, Cincinnati, San Francisco, St. Paul, 15 cents.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Baltimore	5.81	7.17	7.38	6.42	...	6.41	6.78	11.27	6.47	6.47	7.70
Boston	6.51	7.35	8.39	6.55	...	6.57	7.82	11.18	6.56	6.75	7.98
Buffalo	5.80	6.65	8.31	6.21	...	6.05	7.45	11.07	6.08	6.30	7.67
Birmingham	5.80	6.65	7.70[2]	5.80	...	5.80	7.95	...	5.95	6.10	8.15
Chicago	5.80	6.65	7.90	5.82	...	5.98	7.16	10.65	5.95	5.95	7.18
Cincinnati	6.18	6.77	8.26	6.19	...	6.48	7.67	11.17	6.52	6.52	7.67
Cleveland	5.80	6.65	7.54	6.00	...	5.89	7.01	10.79	6.28	6.12	7.51
Detroit	6.00	6.85	8.59	6.13	6.85	6.14	7.40	10.92	6.42	6.47	7.52
Houston	6.74	...	8.62	6.89	...	6.98	...	...	6.82	6.78	8.16
JerseyCity,N.J.	6.26	7.27	8.32	6.56	...	6.75	7.90	9.54	6.39	6.60	8.01
Los Angeles	6.60	8.45	8.45	6.75	11.20	6.95	9.50	12.05	6.60	6.70	8.00
Milwaukee	5.97	6.82	8.07	6.00	...	6.15	7.43	10.82	6.12	6.12	7.35
Moline, Ill.	6.16	7.00	8.25	6.19	...	6.18	8.00	...	6.30	6.30	...
New York	6.26	7.27	8.32	6.56	...	6.74	8.00	11.04	6.39	6.60	8.01
Newark, N. J.	6.62	7.41	8.53	6.56	...	6.59	8.06	...	6.39	6.60	7.18
Norfolk, Va.	6.75	...	...	7.30	...	7.00	8.50	...	6.85	6.95	7.65
Pittsburgh	6.11	7.13	7.70	6.45	8.30	6.57	7.76	10.79	6.17	6.24	7.37
Philadelphia	5.80	6.65	7.90	5.94	...	5.83	7.01	10.65	5.95	5.95	7.18
Portland, Oreg.	7.80	9.05	9.30	7.50	...	7.25	9.75	...	7.25	7.05	9.25
Richmond, Va.	6.14	6.95	8.68	6.53	...	6.30	7.73	...	6.58	6.68	7.80
St. Louis	6.10	6.94	8.05	6.14	...	6.28	7.53	10.95	6.35	6.35	7.58
St. Paul	6.47	7.31	8.56	6.50	...	6.49	7.92	...	6.61	6.61	7.84
San Francisco	6.90	8.20	9.50	6.75	...	6.85	8.70	12.05	6.50	6.75	8.90
Seattle-Tacoma	7.16	8.24	9.20	7.20	...	7.27	9.74	11.70	6.63	7.04	8.90
Spokane (city)	7.80	9.40	9.80	7.15	...	7.10	9.80	11.90	7.00	7.10	9.15
Washington	6.31	7.61	8.90	6.89	...	6.90	8.13	...	6.93	6.95	8.17

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gag extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [5]—1000 to 1999 lb.

Steel Demand Holds at Higher Price Levels

Distributors booking about the same volume as a month ago but expect some changes in buying pattern as consumers revise specifications to counteract changes in extras

Philadelphia—Steel distributors are in the throes of setting up new schedules on virtually all major products as a result of revisions in mill extras.

Higher prices are having little effect on demand, although the warehouses anticipate some changes in the buying pattern as time passes and consumers do their utmost in revising specifications so as to cushion the upward revision in mill extras.

Business this month is expected to be about on a parity with April on a daily tonnage basis, and ahead of last month on a dollar basis, because of price advances being made.

Cleveland—Increased mill extras on a wide range of products will be reflected in an advance in warehouse prices. Adjustment of distributors' schedules now are being made but it will be several weeks before changes are effected on all products for the simple reason all the mills have not yet taken action.

Whether all of the increases will be passed along to consumers is not certain but in view of the shrinking warehouse margins little additional cost absorption is anticipated.

Current demand on the warehouses is holding up well. Meanwhile, though over-all stocks are larger, supplies of the more popular items, such as hot and cold-rolled sheets, plates, shapes and bars, continue out of balance and prospects hold little promise of improvement much before the closing quarter of the year.

Chicago—Steel distributors see no easing in demand for those products which are in short supply; namely, sheets, bars, plates and shapes. They barely hold their own in inventory. Some other products, like wire, cold-rolled strip and galvanized sheets, are in substantial inventory.

New York—Higher prices for steel out of warehouse have not curtailed demand, although increases in base spreads to maintain profit margins, plus extras, have lifted secondary prices to the highest point in years. Carbon bars, hot-rolled rounds, for instance, are now 7.05c delivered metropolitan district and cold-finished rounds 8.20c.

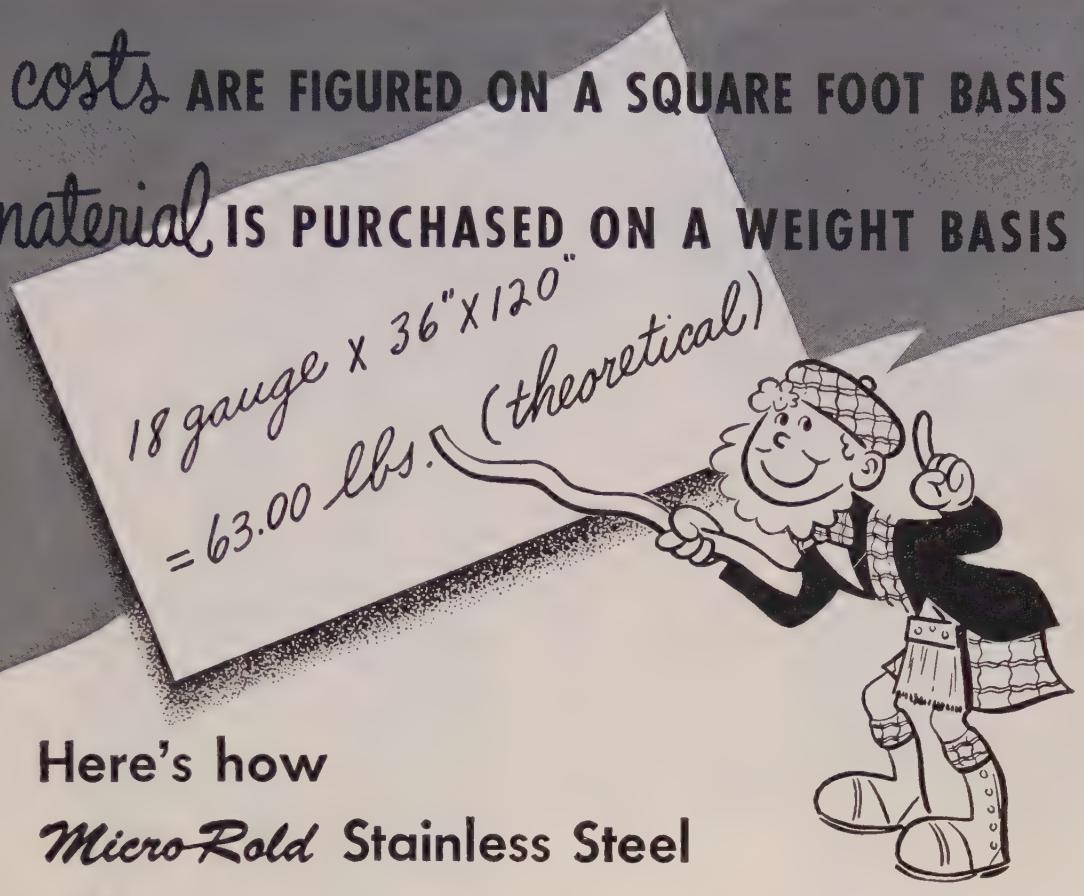
New structural and plate cards bring the heavier products into higher brackets, also sheets. All these products are in short supply, notably structurals. Smaller sizes of cold-finished bars about balance demand with alloy buying lagging somewhat behind that for standard carbon products.

San Francisco—Warehouses, working on new price schedules to reflect increases in mill extras on certain products, report the bulk of upward adjustments will run between 10 and 20 per cent. Meantime, demand continues strong, restricted only by the lack of balanced stocks. Heavy structurals, cold and hot rolled sheets continue among items in greatest scarcity.

Seattle—Warehouse order volume shows the effects of the metalworking strike but turnover has held up surprisingly well. Potential demand is strong for all products. Inventories are fair on local rolled items but plates and hot-rolled sheets, supplied from the East, continue tight. The Geneva, Utah, mill is behind order schedules. Prices are being revised upward. Effective May 6, hot-rolled bars were advanced from 7.08 cents to 7.27 cents, and cold-finished bars from 9.37 cents to 9.74 cents.

Los Angeles — With demand at peak levels and steel deliveries from mills reduced, distributors are girding themselves for less tonnage to sell. Inventories are at 50 to 60 per cent of normal currently, about 2½ per cent higher than in January, but warehousemen expect stocks to lose ground rapidly. Hot-rolled carbon bars advanced 35 cents to $6.95 per 100 pounds and cold finished bars are up $1.10 to $9.50 per 100 pounds.

Job costs ARE FIGURED ON A SQUARE FOOT BASIS WHILE material IS PURCHASED ON A WEIGHT BASIS



Here's how *MicroRold* Stainless Steel SAVES you money

In the use of stainless steel, the selection of gauge number is usually determined by the minimum permissible thickness having sufficient strength to meet the requirements of the application. When you receive material on the heavy side of the gauge you are paying a premium for stainless surface area.

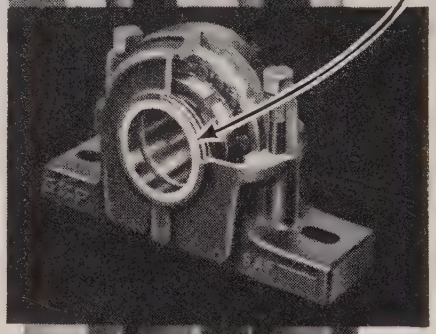
When sheets are ordered by gauge number, the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thus, if you order 18 gauge, you may receive sheets .052" thick, when a thickness of .0475" would suit your purpose. Using a standard 18 gauge 36" x 120" sheet as an example, the theoretical weight is 63.00 pounds, but this weight could permissibly vary between 59.22 pounds and 65.52 pounds. Each .001" of thickness adds 1.26 pounds per sheet.

MicroRold sheets may be ordered by gauge number and you can specify they be rolled on the light side of the gauge range. This is true because the equipment is such that more accurate control of thickness is possible.

If you are not a user of MicroRold sheet it will pay you to get the full details. Your steel warehouse distributor will gladly tell you the MicroRold story.

Washington Steel CORPORATION
WASHINGTON, PENNSYLVANIA

the ring's the thing that KEEPS DIRT OUT



Here's why SKF Triple-Seal "SAF" Pillow Blocks are your solution:

- SKF Triple-Seal "SAF" Pillow Blocks are easy to install and inspect.
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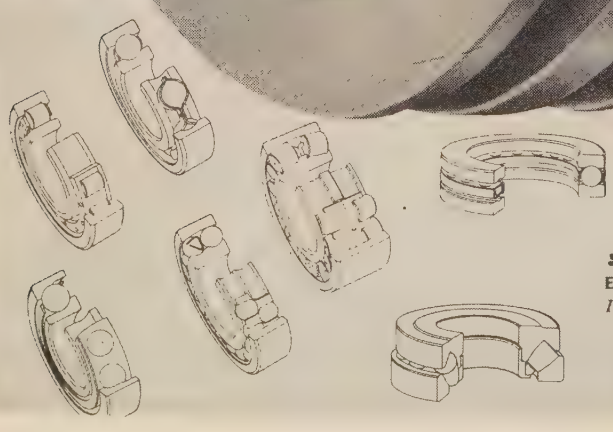

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Pressure for Sheets Undiminished

Consumers seeking heavy tonnages despite recent increase in extras. No early easing in supply seen with large carryover into third quarter indicated

Sheet and Strip Prices, Page 151 & 152

Cleveland — Republic Steel Corp. has just issued revised extra schedules on hot-rolled carbon steel strip, and on galvanized flat sheets, formed roofing, siding and accessories. The new lists are dated May 11, superseding those in effect since Nov. 30, 1950. This follows issuance the week preceding of new schedules on hot and cold-rolled carbon sheets. The changes in schedules are pretty much in line with those announced by other producers, generally running between $4 and $5 per ton.

There is nothing in the present market to indicate any slackening in demand over coming weeks. Pressure from the automotive industry is undiminished, and requirements from the appliance and other consumer goods industries also are pressing.

Some easing in pressure on the mills is expected beginning July when many manufacturing plants begin closing down or curtailing for vacations. However, no order cancellations are in prospect at the moment and with the mills certain to enter third quarter with heavy tonnage carryover there is little prospect of any marked change in supply conditions before the closing three months of the year. Some mills doubt there will be any noticeable easing off in demand even then.

Philadelphia—Carryover in sheets at the end of second quarter will be so heavy the mills generally will be forced to virtually blank out July on new unrated work. Some producers don't know what their quarter-end arrearages are going to amount to, but they are sure they will be heavy on such grades as hot and cold-rolled sheets, electrical sheets and enameling stock.

Sheet demand remains strong although there is the possibility of some letup as summer vacation season gets under way. Too, while no nation-wide steel strike is generally expected as a result of pending wage negotiations, there undoubtedly is some insurance buying, which will ease when, and if, wage conferences are concluded without a general walkout. Sheet producers, however, claim pressure could ease noticeably without bringing demand into balance with supply on most major grades.

Pittsburgh—Sheet producers agree they've never had it so good. From everywhere there is constant demand pressure from customers, but a seemingly diminishing supply of material.

Open hearth curtailments in the district are being felt, and conversion sheet seems to be more of a steady diet for some consumers than before.

Following the pattern set by several other major producers, U. S. Steel Corp. is expected to increase extras on hot and cold-rolled sheets.

New York—Sheet mills generally have revised extras on hot and cold-rolled sheets, and are now taking action on galvanized sheets and certain specialties, including electrical sheets. Also more attention is now being focused on strip extras. One mill, Weirton, adjusted extras on hot strip earlier in the month to be followed May 11 by Republic. Other hot strip producers indicate early action. No revisions have yet been reported on cold-rolled strip.

Chicago—Strong demand for sheets in all categories eliminates the possibility of early attainment of supply-demand balance in this market. Even galvanized sheets, which are moving slowly from warehouses, do not show this condition at mill level.

St. Louis—Probable boosts in sheet extras have been postponed again here, with likelihood they will be announced this week. Detailed changes are still under study. Sheet demand remains high with some pickup in pressure on galvanized. Farm demand appeared easing for a time, but looks better now.

Granite City Steel Co. made industry news by re-entering the commercial hot-rolled sheet market, having almost entirely withdrawn in 1948. It is booking hot-rolled sheet orders now for delivery starting in September.

Birmingham—Regional producers see no indication of weakening demand for sheets. Such is seen as a remote possibility in view of accelerated sheet outlets during the past few years.

Los Angeles—Shortage of sheets is intensifying, placing manufacturers and fabricators in near "desperate" situations. Some fabricators are unable to accept new orders until fourth quarter.

Parents Arm Fighting Sons

Mrs. E. K. Geary, McKeesport, Pa., inspector at Christy Park Works, National Tube Division, U. S. Steel Corp., assisted by Emmett Thomas, general foreman, counts the 10-millionth ordnance piece produced at the plant since Korea. Mrs. Geary and Mr. Thomas have sons in military service

Sheet & Tube Raises Extras

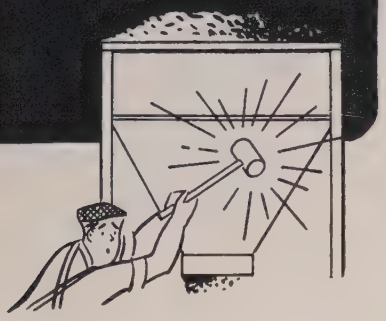
Youngstown—Youngstown Sheet & Tube Co. last week announced upward revisions in extras on hot and cold-rolled bars, hot and cold-rolled sheets, wire products and tubular goods. Extent of the changes was not given but it was intimated the new cards are in line with those issued by other producers.

Schedule Vacation Shutdowns

Atlanta, Ga.—Shutdown of producing facilities for vacation periods will not interfere with shipments of available material, the Atlantic Steel Co. announced last week.

Vacation shutdowns are scheduled as follows: Rod mill producing reinforcing bars, rounds, flats and wire rods, weeks of June 7 and 14; 8-inch hoop mill, producing small strip and cotton ties, weeks of June 7 and 14; billet mill, producing large flats, weeks of June 7 and 14; electric furnace, producing ingots, weeks of June 7 and 14; 10-inch hoop mill, producing angles, channels, tees, bevel, miscellaneous sections and large strip, weeks of July 19 and July 26; wire departments, weeks of June 21 and June 28; galvanizing department, weeks of July 5 and July 12; manufacturing department, forgings, stampings and heat treating, weeks of July 5 and

BIN
STUCK LATELY?



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July 12. Maintenance work will be done during the vacation shutdowns.

Wire . . .

Wire Prices, Page 152

New York—Buyers of many steel wire products placing orders currently have vague knowledge as to price of material delivered their plant. Numerous and varying extras, from rods to finished wire have not been digested and billing is more complicated with freight, tax charges and extras included. In the final analyses base prices mean little. There are wide spreads between minimum and maximum extras, but the average overall increase approximates 6 per cent.

Chicago—Wiremakers are revising their extras upward and for a few products base prices are being increased. One midwestern independent, for example, has advanced merchant wire, annealed, $6 per ton, and galvanized by $11. All price lists are undergoing critical study.

Steel Bars . . .

Bar Prices, Page 150

New York—Cold-drawn carbon bar mills as well as producers of hot-rolled carbon bars have completed revisions in extras. However, some sellers have still to act on alloys, both hot and cold grades. No letup in demand is noted. Most, if not all, producers of hot carbon bars have blanked out July on new unrated tonnage due to anticipated arrearages.

Phladelphia—With most bar producers well behind on commitments and consumers endeavoring to get more tonnage on mill books in third quarter than producers claim they can handle, there appears to be every likelihood of high activity well into the fall.

Summer vacations may take a little of the pressure off and a settlement of steel wage negotiations without a nation-wide strike might eliminate protective buying, but over-all demand will probably remain strong.

Pittsburgh — While heavy demand for bars is evident, mills in the district are doing a good job meeting it. Some re-adjustment in deliveries will come by end of second quarter. At present deliveries are described as "fairly current."

Cleveland—Higher extras on the various grades of bars are not likely to discourage buying to any extent. Some consumers, however, may seek to avoid or cut down the increased costs by changing their specifications as far as possible.

Virtually all producers have an-

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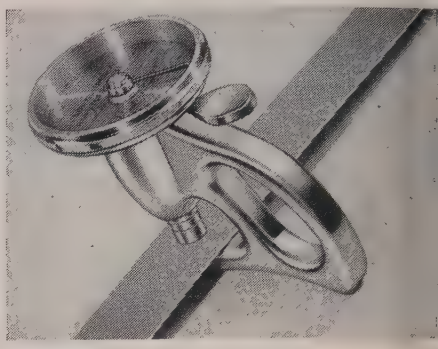

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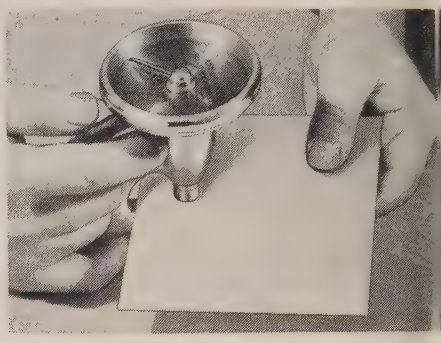

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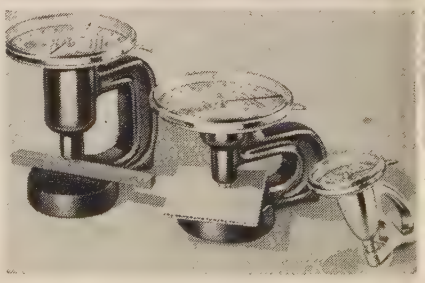

Write for complete information and prices

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Diamond Wire Spring Company makes long runs, eliminates costly breaks with Pittsburgh Steel Oil Tempered Spring Wire

Skilled workmen, modern machines and Pittsburgh Oil Tempered Spring Wire form a combination that is hard to beat for producing quality springs with economy. *Users tell the quality story* better than we can. For example, skilled machine operators at the Diamond Wire Spring Company plant in Millvale, Pa., sum it up this way. They like Pittsburgh Wire because it enables them to make long runs without costly stops caused by broken wire. Matthew Kline, a veteran with twenty years experience making steel springs, said:

"Pittsburgh Wire is good stuff. I can tell by the way it handles whether it's Pittsburgh or some other make. I like it because it keeps my machine going full tilt for long runs. The management likes it too—helps keep costs down."

For this reason, Diamond Wire Spring Company uses tons of Pittsburgh Steel's Oil Tempered Spring Wire to produce thousands on thousands of springs for farm implement machinery and journal box lids for railroads.

If you manufacture springs and other products from wire, we would like to show you how others eliminate production difficulties, maintain high quality of their products with Pittsburgh Oil Tempered Spring Wire. Just give it a trial.

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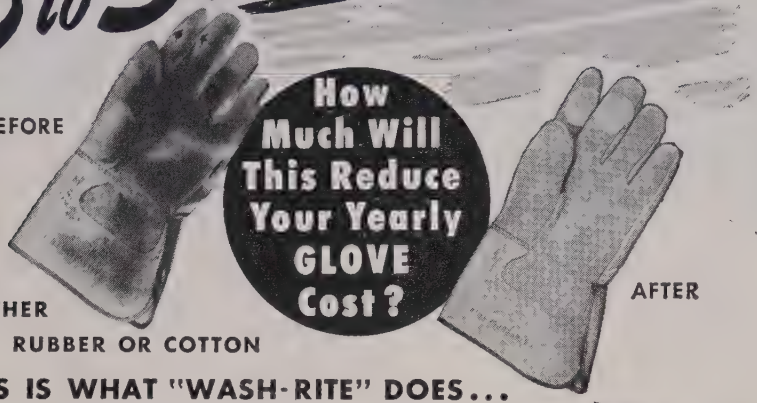

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nounced revisions in their schedule on hot-rolled and cold-finished carbon bars and are now issuing new schedules on cold-finished alloy bars, rounds, hexagons, squares and flats. Republic Steel Corp.'s new card on these latter items is dated May 7.

Substantial carryover from second to third quarter is indicated with the result not much supply relief in prospect through the summer.

Plates . . .

Plate Prices, Page 150

Philadelphia — While most plate mills have revised extras on plain carbon material, they have not acted on alloy plate, although the matter is under study. Nor have producers of floor plate taken action.

Most mills have not only revised various extras, but have added some new ones. For instance, new width extras have resulted from the establishment of over 60-in. as base, compared with over 48-in., and new thickness extras have resulted from a change in the base from ⅜-in. to ½ in. New odd gage extras have been named.

District mills that have revised plain carbon plate extras in one degree or another are Bethlehem Steel Co., Alan Wood Steel Co., and Lukens Steel Co. The Central Iron & Steel Co. is contemplating early change; also the Claymont Division, Colorado Fuel & Iron Corp.

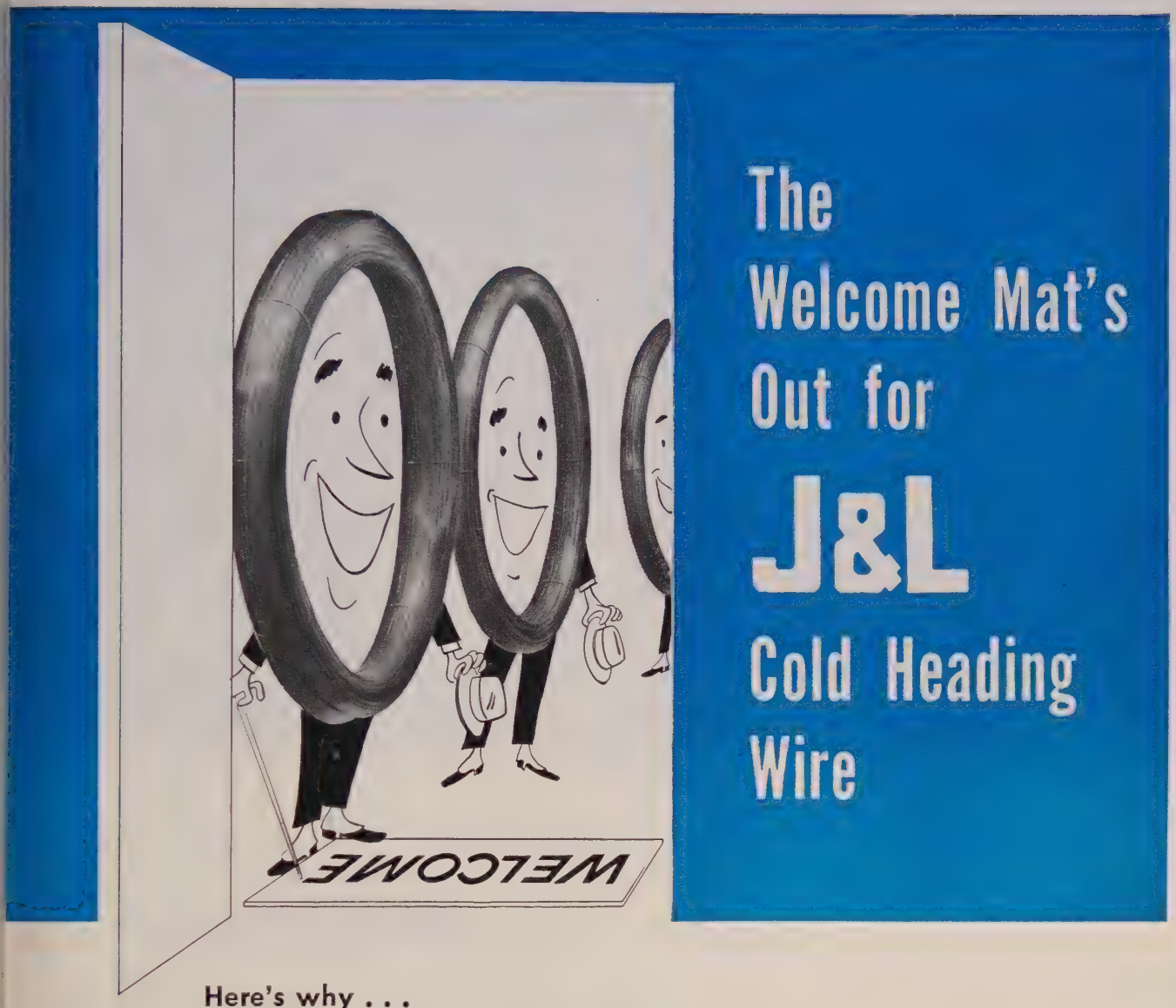
Pittsburgh—U. S. Steel Corp. issued its new extra card on plates mainly representing an increase of $3 per ton on thickness and width extras. Specification extras were increased by the same amount with one exception. Extras on structural silicon steel (A-94) were boosted $5 per ton.

The extra book also listed a new extra—the odd gage extra. This will increase by about $3 per ton the cost of plates purchased that are of different thickness than those listed in the table of even gages shown in the extra book. This is the first instance of a steel company protecting itself from the scrap losses that arise from odd-lengths.

New York—By the end of last week virtually all plate producers had revised schedules on plain carbon material. No changes have yet been reported on floor plate and alloy plate. Demand continues active.

Birmingham—Tight production and supply situation is foreseen for plates in third quarter. Large users are not supplied as well as they would like to be which precludes the

(*Please turn to Page* 164)



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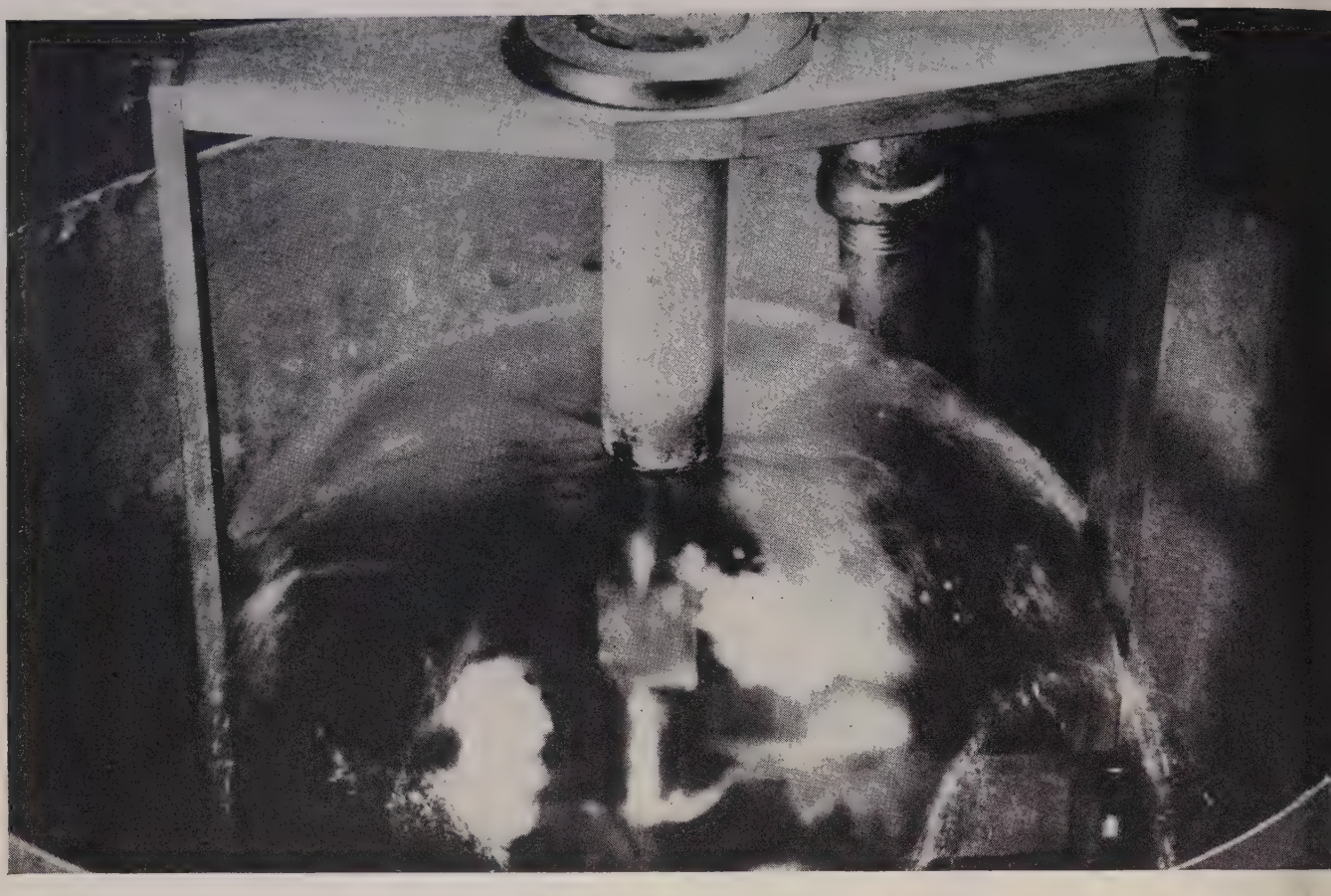

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Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $85, Palmerton, Pa.; $85, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $225 per gross ton of alloy, c.l. packed $237; gross ton lots, packed, $252; less gross ton lots, packed $269; f.o.b. Sheridan, Pa., Alloy, W. Va., Niagara Falls, N. Y., Ashtabula, Philo or Marietta, O., Lynchburg, Va. Base price: $227, Johnstown, Pa.; $226, Anaconda, Mont. (Mn 74-76%, C 7% approx.) Base price per net ton $200, Etna, Pa.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $267; less gross ton lots, $284, f.o.b. Chicago. Add or subtract $2.80 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P. 0.06% max). Add 0.5c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C. 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 30c; ton lots, 32c; 250 to 1999 lb, 34c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed, 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max. Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High - Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%) Contract, carload, lump, bulk, max. 0.03% C 37.60c per lb contained Cr, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%) Contract, c.l. S M x D, bulk, 26.25c per lb of contained Cr. C.l., packed 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 25.90c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 38-39%, Al 7-9%, C 0.05% max.) 25.75c per lb of contained silicon plus 16.4c per lb of contained silicon plus aluminum 3" x down, delivered.

Chromium Metal: (Min 97% Cr and 1% Fe) contract carload, 1" x D; packed, max 0.50% ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c; prices on 0.10 per cent carbon grade, C grade, $1.12 per lb of contained chromium, up 4c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more, $4.35 per lb of contained W; 2000 lb W to 10,000 lb W, $4.45; less than 2000 lb W, $4.57, f.o.b. Niagara Falls, N. Y.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton lot 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr, 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

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A Spectacular Performer in the Fine Trolley Field

This completely new trolley conveyer, designed to meet the requirements of the most discriminating buyer, is the result of five years of intensive development by Mathews Engineers. The top-quality precision wheel, with hardened races, is the heart of this rugged newcomer to the fine 4" trolley conveyer field. For the overhead conveying job that demands stamina and exceptional performance, we believe the No. 4207 Loadstar is without equal anywhere.

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Plates . . .

(*Continued from Page* 160)

possibility of any extra available tonnage in the remaining months of the year.

Los Angeles—Virtual drying up of plate deliveries coupled with acutely slim inventories cause some fabricators' work schedules to lag as much as five months. Producers' plate deliveries are extended one to five months.

Structural Shapes . . .

Structural Shape Prices, Page 150

Philadelphia — Structural fabricators are beginning to quote on a generally higher level as result of increases in mill extras on shapes, plates and bars. This does not mean increased costs are being fully passed along, for competition, particularly among the smaller shops, still is keen. The trend, however, is upward.

The two district shape producers, Bethlehem Steel Co. and Phoenix Iron & Steel Co., have adjusted extras along with United States Steel Corp. and other makers.

The Delaware River Bridge Authority is expected to issue plans around June 1 for substructure work on the bridge to be erected over the Delaware river just south of this city. The whole project, it is estimated, will require well in excess of 40,000 tons of structurals.

Boston—Mild flurry in bridge bidding has cleaned up most tonnage in that category, approximately 2200 tons. American Bridge Division, U. S. Steel Corp., booked 1200 tons, Bangor-Brewer, Me., bridge and Bethlehem Steel Co., 500 tons, Norwich, Conn.

Larger fabricating shops are heavily booked with girder work well into fourth quarter.

New York—Great percentage of structural work now being figured is still for public account. Several bridge jobs, including 5600 tons of state bridge work in Oneida county, N. Y., are on the point of being placed. Other sizable jobs are being figured.

Pittsburgh—New extras on structural steel shapes were announced by U. S. Steel Corp. last week, with several noteworthy variations from the company's previous card. Nine by four angles, for example, no longer take an extra. On the previous extra card, 3½-inch standard angles carried a cost of approximately $3 per ton. The new extra makes these about $10 per ton. Prices for the other sizes vary proportionately.

Seattle—Structurals are in strong

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WELDMENTS,
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CORRECT DESIGN
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SAVING IN WEIGHT
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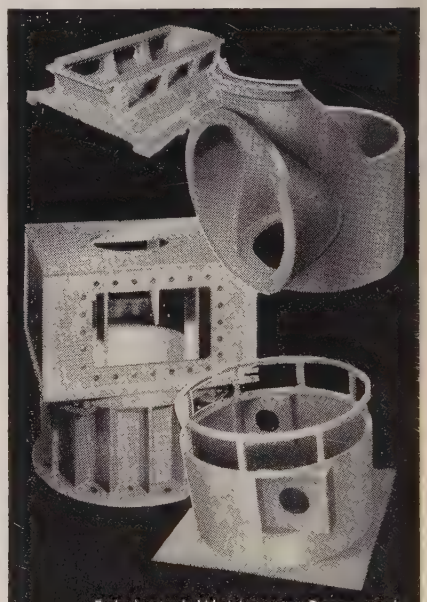

Fabricated Weldments, Bases and Sub-Assemblies are demanded by industry today because they insure accuracy, economy and modern design. They provide strength that withstands shock, strain, vibration, reduces machining and weight.
Littleford Fabricated Weldments, Bases and Sub-Assemblies are backed by years of experience in shearing, bending, forming, welding and finishing plate and sheet metals. Littleford has never lost sight of the fact that accuracy and quality are essential to the finished product. If you have a problem involving Fabricated Weldments, Bases or Sub-Assemblies, send blueprints to Littleford and see how experience can give low-cost quality products.

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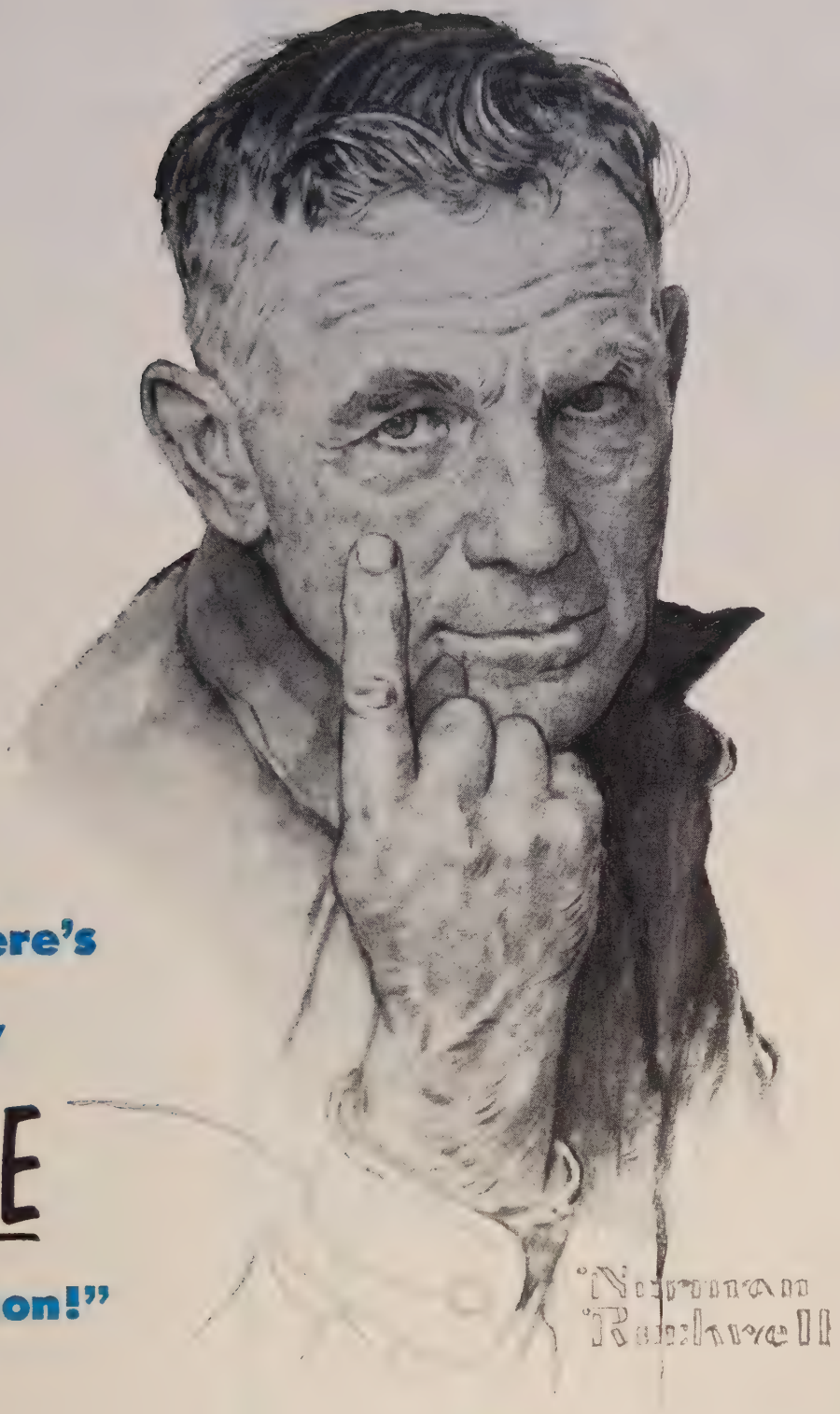

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demand. Sizable awards are pending for Alaskan installations, state highway jobs, transmission lines and other public works.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 150

Los Angeles — Fabricators look for reinforcing bar demand to be the greatest ever experienced. With plain bars available in unlimited quantities on current delivery, fabricators' inventories of reinforcing steel are bigger than ever in history.

Seattle — Rolling mills hold substantial backlogs and are operating full schedules. Current orders consist largely of small tonnages for schools, small industrial plants, etc.

Rails, Cars . . .

Track Material Prices, Page 152

Pittsburgh—Increases in base prices and extras for rails and track accessories were effected May 9 by United States Steel Corp. and its operating divisions, Columbia-Geneva Steel and Tennessee Coal & Iron. The increases in base prices amount to 3/10 cent per pound for standard rails and less than 2/10 cent per pound for rail fastenings.

The new prices are: Standard tee rails, over 60 pounds per yard, 4.075 cents per pound for No. 1 open hearth, 3.975 cents for No. 2 open hearth, and 4.025 cents for all No. 2 open hearth; light rails, 60 pounds per yard and under, 5.00 cents; joint bars for standard rails, 5.075 cents; tie plates, 4.925 cents Gary, Ind., and Fairfield, Ala., and 5.075 cents, Pittsburgh and Torrance, Calif.

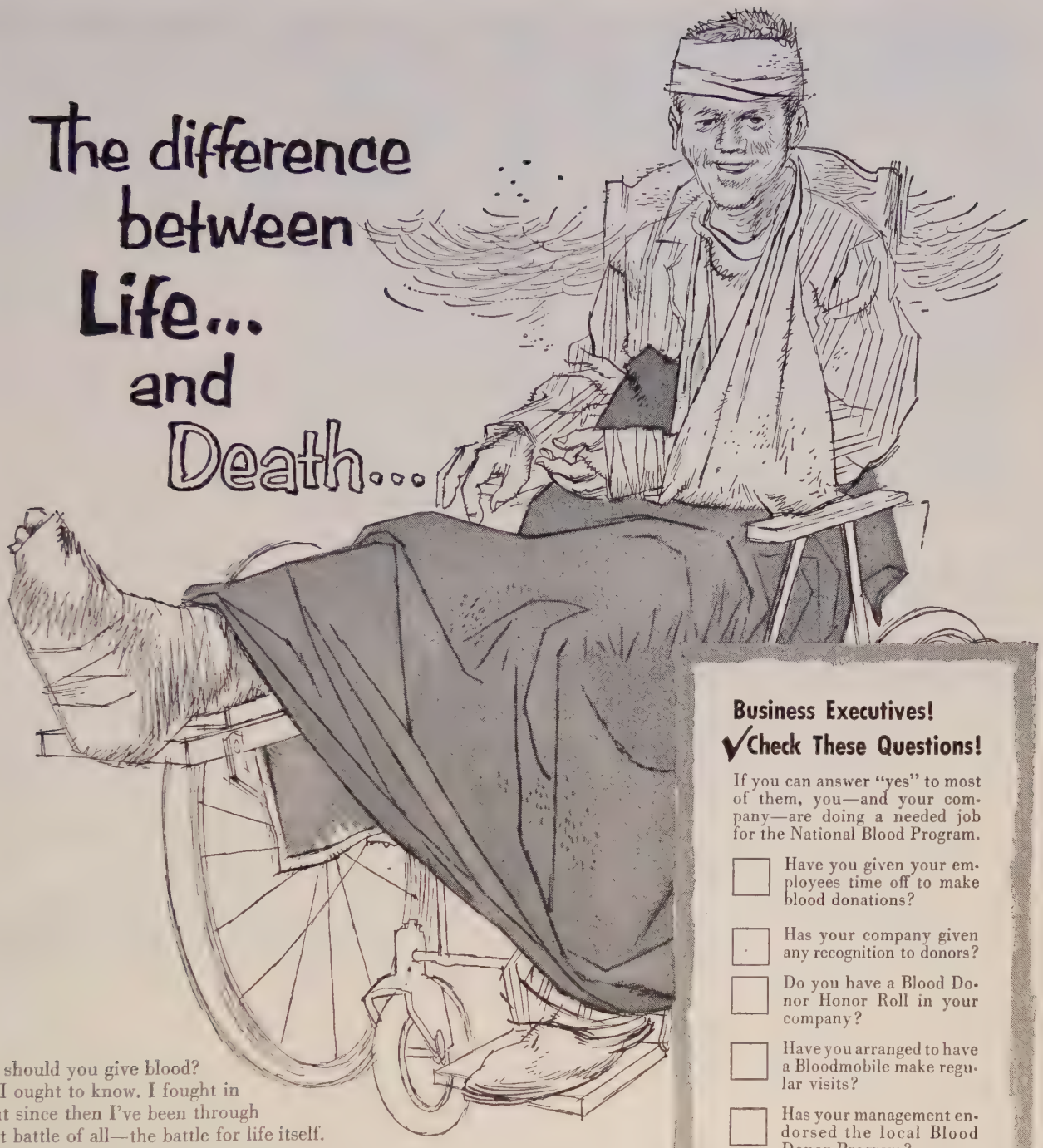
Revisions in extras covering carbon and high strength plates and structural shapes are being made effective, as well as upward revisions in the price structures for wheels, axles and ferromanganese.

New York—Domestic freight car orders in April involved 2432 units, according to the American Railway Car Institute and the Association of American Railroads. Cars on order as of May 1 were 62,637. April deliveries totaled 6839 units against 6679 in March and 7403 in April a year ago.

United States Steel Export Co. has increased prices on rail and accessories for shipment abroad, effective May 9. Changes reflect revisions in domestic prices on these products.

The Export company is now quoting $95.15 per net ton on standard rails, 61 pounds and over, and $111.36 on light rails, 60 pounds and under. Joint bars for standard rails are being quoted $6.195 per hundred pounds, and tie plates $6.245.

The difference between Life... and Death...



"Why should you give blood? Ask me—I ought to know. I fought in Korea. But since then I've been through the biggest battle of all—the battle for life itself. And it was blood—and blood alone—that saved me. Don't know when I'll be in a position to start repaying my debt by giving some blood of my own. But I will—some day. You can count on it!"

All kinds of people give blood—for all kinds of reasons. But every reason for giving blood is a *special* reason . . . just as every American life that can be saved at any time and at any place . . . is special. So whatever *your* reason for giving blood, this you can be sure of: Whether it goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Give Blood Now

CALL YOUR RED CROSS TODAY!

NATIONAL BLOOD PROGRAM

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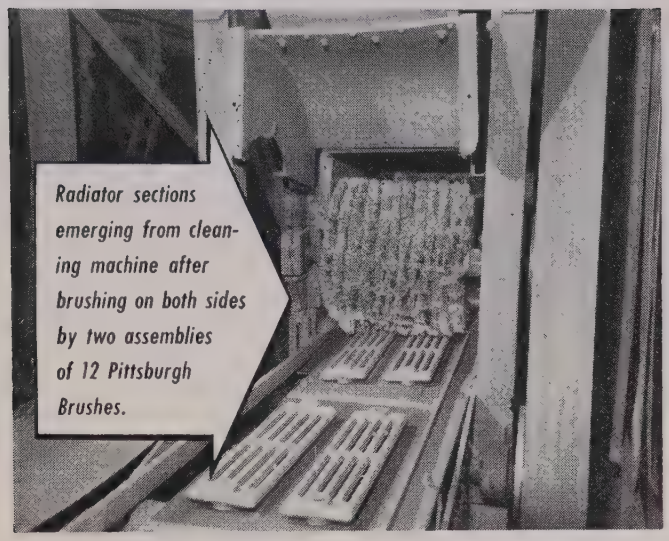
Business Executives! ✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Has your company given any recognition to donors?
- ☐ Do you have a Blood Donor Honor Roll in your company?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?
- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Have you conducted a Donor Pledge Campaign in your company?
- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*



Radiator sections emerging from cleaning machine after brushing on both sides by two assemblies of 12 Pittsburgh Brushes.

Pittsburgh Brushes can help you solve problems like these!

Cleaning Narrow Spaces—National Radiator Company, Johnstown, Pa., cleans 30,000 radiator sections a week! To insure a perfect final finish, even the narrowest spaces must be absolutely clean prior to assembly. Pittsburgh engineers were asked to design a brush that would reach these spaces and would fit National's existing machine. Successful? National reports: "Pittsburgh Brushes do a better job of cleaning and are more economical!"

Preparing Chills—At Continental Foundry & Machine Co., East Chicago, Indiana, chills used to cast iron rolls must be cleaned of the oxidized metal remaining from previous usage, as well as dirt and grease accumulated in storage. After experimenting with other brushes, Continental chose Pittsburgh because they "do the job better and stand up longer than any previously used!"

Improving Original Equipment—The Sommer and Maca Glass Machinery Co., Chicago, Illinois, uses Pittsburgh Brushes in the automatic washing machines they manufacture. Brushes formerly used simply didn't have the over-all density pattern needed. Pittsburgh engineers studied the problem and designed a brush which Sommer and Maca approved "because of (its) denser bristle pattern and lower cost."

WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W-11, 3221 Frederick Ave., Baltimore 29, Maryland.

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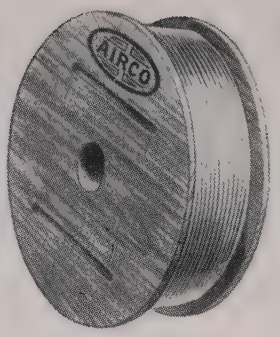

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Airco ALUMINUM ..... **3/64", 1/16", 3/32", 1/8" dia.**
Airco STAINLESS ..... **.035", .045", 1/16", 3/32" dia.**
Airco COPPER-BASE ALLOYS ..... **.035", .045", 1/16", 3/32" dia.**

For complete price list and table of all Airco wires, including chemical analyses, gauges, lengths and stock numbers, call your nearest Airco office, or write Dept. 17 S Air Reduction Sales Company, 60 East 42nd Street, New York 17.

Specify Airco wire for —

- **Controlled, uniform chemical analysis**
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Tubular Goods . . .

Tubular Goods Prices, Page 153

Pittsburgh—Tubular Products Division, Babcock & Wilcox, last week announced it was increasing prices on seamless carbon and alloy tubing, effective May 13, to compensate for recent cost increases including the latest advances in extras on carbon steel tube rounds and alloy bars.

New York—Following the lead of Youngstown Sheet & Tube Co. in revising pipe extras May 8, Wheeling Steel Corp. advanced its extras effective May 11 and Republic Steel Corp., effective May 13. Other leading producers contemplate similar revisions.

Seattle—Demand for cast iron pipe is fairly active. In some cases, however, competing types of pipe have been purchased recently. Delivery schedules on cast iron pipe in this area now are on a competitive basis.

Iron Ore . . .

Iron Ore Prices, Page 171

Cleveland—Iron ore is moving from the head of the lakes in volume that promises a new record movement in the 1953 shipping season should the present rate of shipments continue without interruption. Shipments in the week ended May 11 totaled 2,489,802 gross tons, according to the Lake Superior Iron Ore Association. This brings the season total to date to 12,634,950 tons. In the like week last year shipments were 2,725,708 tons and the season movement to that week 10,213,459 tons.

Ferroalloys . . .

Ferroalloy Prices, Page 163

New York—U. S. Steel Corp. advanced ferromanganese approximately $4 per net ton, effective May 9. Material is now quoted on the basis of 10 cents per pound for 74 to 76 per cent grade, with an addition of one-tenth of a cent for each percentage point above the 76 per cent maximum and a deduction of one-tenth of a cent for each percentage point below the 74 per cent minimum.

Under the new schedule, U. S. Steel is quoting, for instance, 75 per cent ferromanganesee at $200 per net ton, against $196.07 previously.

It has been quoting ferromanganese on the basis of 74-76 per cent instead of 78-82 per cent, since Mar. 20 when the National Production Authority, because of increasing scarcity of the higher grades of ore, authorized use of the lower percentage base. However, not all producers went to the lower base.

Republic Rubber Hose helps big blast furnace builder eliminate *L·o·s·t W·o·r·k·i·n·g T·i·m·e!*

A combination of tough Republic Hose and fast Republic service keeps assembly lines moving at The William B. Pollock Company.

In the shop and in the field, this big blast furnace producer subjects hose to almost impossible work conditions (abrasion, flexing, cutting, tremendous pressure surges, etc.) . . . and, as a matter of course, they expect results that pay off!

In the shop, Republic Hose delivers fuel for welding and power for the big chipping tools and riveting guns.

In the field, where the big furnaces are finally assembled, there's literally miles of hose used. A riveter atop an open hearth stack can be as high as 520 ft. up, and another 500 or more feet away from an air line source.

He needs hose that's strong, yet light and flexible enough for maximum handling ease . . . hose with smooth, friction-reducing tubes that don't dissipate working pressure en route to point of use. And, if a red-hot glob of molten metal splashes the lines, there's replacements needed and **right now!**

Here, The William B. Pollock Company, like other big industrial organizations, knows what it means to work with a local Republic Rubber Distributor . . . a distributor who's ready day or night to respond to hurry-up calls for any needed product of industrial rubber.

Yes, it really pays to use Republic Rubber Products . . . products designed specifically for your own job requirements . . . products delivered to your own time specifications!

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IF IT'S *RIVETED* YOU *KNOW* IT'S SAFE

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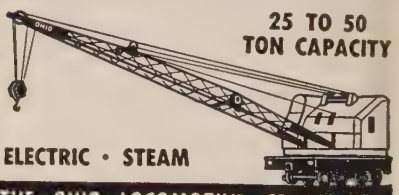

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ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in Italic.

ORES

Lake Superior Iron Ore

(Prices effective for ore delivered up to and including June 30, 1953; gross ton, 51.50% iron natural, rail or vessel, lower lake ports.)

Old range bessemer	$10.10
Old range nonbessemer	9.95
Mesabi bessemer	9.85
Mesabi nonbessemer	9.70
Open-hearth lump	10.95
High phosphorus	9.70

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect on Dec. 31, 1952, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematites (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$55.00
Domestic scheelite, mine	63.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.21 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 90c-93c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 2:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° *F*: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Perla, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa. $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent*: Clearfield, Pa., St., Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.
60 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.
70 *Per Cent*: St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

METALLURGICAL COKE

Price per net ton
Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00
New River foundry	20.80
Wise county foundry	15.95
Wise county, furnace	15.20

Oven Foundry Coke

Kearney, N. J. ovens	$24.00
Everett, Mass., ovens	
New England, del.	*26.00
Chicago ovens	24.50
Chicago, del.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, del.	28.12
Cincinnati, del.	25.85
Painesville, O., ovens	25.50
Cleveland, del.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	21.65
Cincinnati, del.	26.58
LoneStar, Tex. ovens	18.50
Philadelphia, ovens	23.95
Swedeland, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, del.	26.00
Portsmouth, O., ovens	24.00
Cincinnati, del.	26.62
Detroit, ovens	25.50
Detroit, del.	26.50
Buffalo, del.	28.08
Flint, del.	28.23
Pontiac, del.	27.06
Saginaw, del.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, ovens

Phenol, 40 (carlots, nonreturnable drums)	17.25

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38.

Imported, net ton, duty paid, metallurgical grade, $35-$36.

Heavy-Duty
INDUSTRIAL
GEARS
in diameters
up to 12 feet
Simonds
CUT Gears
Spur · Bevel · Mitre · Worm
Worm Gears · Racks · Pinions
For big heavy-duty industrial gears, made of all materials, call on Simonds. Backed by a 60-year reputation for dependability, Simonds is equipped right to match your most exacting specifications . . . geared right to give you fast delivery and custom service. Simonds regularly produces spur gears in diameters up to 12′, worm gears to 6′, bevel and mitre gears to 5′.
SIMONDS also is stock carrying distributor for Ramsey Silent Chain Drives and Couplings; and industrial V-Belts.
SIMONDS GEARS
THE
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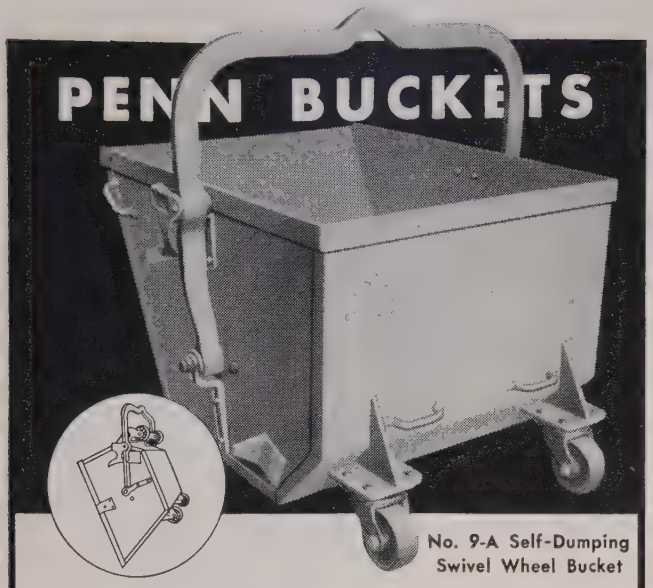
GEAR & MFG. CO.
LIBERTY at 25TH
PITTSBURGH 22, PA.
This large spur ring gear has a diameter of 12′ 2″, with a total of 144 teeth.

PENN BUCKETS



No. 9-A Self-Dumping Swivel Wheel Bucket

Careful balancing makes Penn Buckets self-dumping when loaded and self-righting when empty. Welded construction prevents "clinging", makes them empty easily and completely. The swivel wheels increase handling efficiency, too.

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PENN IRON WORKS, INC.
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REVCO
SUB-ZERO CHEST TO -95° BELOW ZERO

FOR SHRINK FITS

SEASONING GAUGES and PRECISION TOOLS

FOR TESTS

Completely equipped ready for operation. The 1.5 Cu. Ft. model as shown handles parts or assembled units up to 23″ long, 12½″ deep x 9″ high and the 6.5 Cu. Ft. model up to 47″ lengths, 16″ deep x 15″ high. Revco Sub-Zero Chests meet highest performance standards featuring temperatures of 95° and 85° below zero while running continuously in normal room temperatures. Other controlled low-temperatures readily attained.

REVCO RIVET COOLER for aircraft application is equipped with 90 rivet canisters in six convenient removable racks. Operates efficiently at temperatures as low as minus 35° F.

WRITE FOR DATA AND PRICES.

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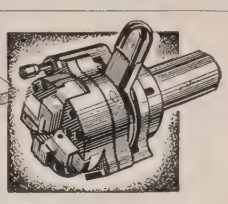

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Pig Iron . . .

Pig Iron Prices, Page 146

New York—Pig iron demand continues steady but limited due to restricted melting operations in this area. Foundry operations, especially at gray iron shops, continue to lag. No early improvement is indicated. There is an ample supply of iron to meet all requirements.

Philadelphia—Pig iron supply and demand continue in fairly close balance. Any real pickup in gray iron foundry operations might actually result in some squeeze with district consumers having to turn more to producers in other areas, something they are already doing to a certain extent.

Pittsburgh—Demand for foundry pig iron has fallen to its lowest point in months. The hoped-for seasonal increase in foundry business has not materialized and foundries are correspondingly slack.

Cleveland—Merchant iron demand lacks zip although tonnage is moving from the furnaces sufficiently fast to prevent any substantial piling of furnace stocks. Foundry operations, however, continue spotty and ordering of iron is kept pretty much in step with actual needs.

Ground was broken last week for the new blast furnace to be installed here by American Steel & Wire Division, U. S. Steel Corp. This stack, to be of 1350-ton daily capacity, will be the largest exclusive merchant pig iron furnace in the nation. A large part of the stack's output will go to Ford's new foundry here.

Chicago—Jobbing foundries could use more business but those serving the automotive industry are busy and seem likely to continue so well into third quarter. Pig iron supply is adequate to accommodate the current melting rate but there is no surplus.

St. Louis—Pig iron available to the open market here is expected to decline the remainder of the year. One of the area's two stacks is overdue for relining. Probable consumer allocations are under computation now and will be announced in the next few weeks.

Birmingham — Pig iron demand holds up well but with much of the pressure off. Merchant iron sellers are disposing of their tonnage but have some occasionally available.

Scrap . . .

Scrap Prices, Page 174

New York—Scrap brokers have reduced buying prices on machine shop turnings to $17 to $18, and on No. 1 cupola cast to $33 to $34. On the other hand, they have increased prices on shovel turnings to $22.50 to $23.50. No. 1 heavy melting and No. 2 heavy melting grades are unchanged, although there is little consuming pressure. The current price on No. 2 bundles is $28, which through a typographical error were erroneously quoted at $19 last week.

Pittsburgh—Opinion among scrap men is that the market will become worse before it gets better. Few mills are buying. With substantial inventories they are holding back heavy purchases.

Prices have dropped further. No. 2 bundles sold at $31 to $32 last week, and a further weakening is in the offing. Machine shop turnings dropped 50 cents to $26.50 to $27. Short shovel turnings dropped $1 and cast iron borings hit the skids at $2 less than the week before. Cut structurals are finding stiff buyer resistance at a price $3 lower at $45 to $46.

Philadelphia—Consumer demand for steel as well as cast grades of scrap continues limited with indications that most consumers have good inventories on hand. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are off $1 per ton to $41 delivered, and No. 2 heavy melting is off approxi-

(*Please turn to Page* 176)

If your workers "can't hear themselves think," chances are *you'll* hear about it in lowered production and damaged hearing.

Loud industrial noises sap energy, interfere with job concentration, and sometimes result in serious hearing loss. M.S.A. Ear Defenders block out these costly noises, yet allow wearer to hear warning signals, speech, and telephone conversation.

M.S.A. Ear Defender design insures comfortable fit; complete closure of ear canal; easy to insert, remove. Ear Defenders are easily cleaned with soap and water. Convenient carrying case keeps them clean in pocket. Write for details.

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Pittsburgh 8, Pa.

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You get *more work* out of a bucket that holds steady and is back in position *quicker* for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

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IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

May 14	$38.83
May 7	39.67
Apr. avg.	43.05
May 1952	43.00
May 1948	40.67

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting...	39.00-40.00
No. 2 heavy melting...	36.00-37.00
No. 1 bundles	39.00-40.00
No. 2 bundles	*31.00-32.00*
No. 1 busheling	39.00-40.00
Machine shop turnings	*26.50-27.00*
Mixed borings, turnings	26.50-27.00
Short shovel turnings	*30.00-31.00*
Cast iron borings	*29.00-30.00*
Cut structurals	*45.00-46.00*
Heavy turnings	41.00-42.00
Punchings & plate scrap	48.00-49.00
Electric furnace bundles	46.00

Cast Iron Grades

No. 1 cupola	*39.00-40.00*
Charging box cast	*38.00-39.00*
Heavy breakable cast	*37.00-38.00*
Unstripped motor blocks	35.00-36.00
No. 1 machinery cast	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt	*45.25-46.25*
Rails, 2-ft. and under	52.00-53.00
Rails, 18-in. and under	*53.00-54.00*
Rails, random lengths	48.00-49.00
Railroad specialties	51.00-52.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting	39.00
No. 2 heavy melting	34.00-34.50
No. 1 bundles	39.00-40.00
No. 2 bundles	32.00-33.00
No. 1 busheling	38.00-39.00
Machine shop turnings	22.00-23.00
Mixed borings, turnings	27.00-28.00
Short shovel turnings	27.00-28.00
Cast iron borings	27.00-28.00
Low phos.	43.00-44.00
Alloy free, short shovel turnings	30.00-31.00
Electric furnace bundles	41.00-42.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Charging box cast	44.00-45.00
Stove plate	44.00-45.00
Heavy breakable cast	39.00-40.00
Unstripped motor blocks	27.00-28.00
Brake shoes	39.00-40.00
Clean auto cast	50.00-51.00
No. 1 wheels	40.00-41.00
Burnt cast	37.00-38.00
Drop broken machinery	46.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00
R.R. Malleable	49.00-50.00
Rails, 3-ft. and under	*52.00-53.00*
Rails, 18-in. and under	55.00-56.00
Rails, random lengths	*48.00-49.00*
Cast steel	49.00-50.00
Railroad specialties	50.00-51.00
Uncut tires	49.00-50.00
Angles, splice bars	52.00-53.00
Rails, rerolling	53.00-54.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting	41.00-42.00
No. 2 heavy melting	34.00-35.00
No. 1 bundles	41.00-42.00
No. 2 bundles	33.00-34.00
Machine shop turnings	22.00-23.00
Short shovel turnings	29.00-30.00
Cast iron borings	30.00-31.00
Low phos.	47.00-48.00
Electric furnace bundles	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	46.00-47.00

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting	*41.00*
No. 2 heavy melting	*38.00*
No. 1 bundles	*41.00*
No. 2 bundles	*32.00*
No. 1 busheling	*41.00*
Machine shop turnings	27.00-28.00
Mixed borings, turnings	*32.00*
Short shovel turnings	*33.00*
Structurals & Plate	45.50-46.00
Heavy turnings	39.50-40.50
Couplers, springs, wheels	50.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Charging box cast	*40.00*
Heavy breakable cast	*43.00*
Unstripped motor blocks	31.00-32.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' Buying Prices)

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	30.00
No. 2 bundles	*28.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, short turnings	22.00-22.50
Low phos. (structural & plate)	37.00-38.00
Shovel turnings	*22.50-23.50*

Cast Iron Grades

No. 1 cupola	*33.00-34.00*
Unstripped motor blocks	22.50-23.00

DETROIT

No. 1 heavy melting	37.00-38.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	37.00-38.00
No. 2 bundles	23.00-24.00
No. 1 busheling	40.00-41.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Punchings & plate scrap	40.00-41.00

Cast Iron Grades

No. 1 cupola	47.50
Charging box cast	39.00-40.00
Stove plate	39.00-40.00
Heavy breakable	29.00-30.00
Unstripped motor blocks	30.00
Clean auto cast	42.00-43.00
Malleable	48.00

CINCINNATI

(Delivered consumer plant)

No. 1 heavy melting	41.00
No. 2 heavy melting	37.00
No. 1 bundles	41.00
No. 2 bundles	34.00
No. 1 busheling	41.00
Machine shop turnings	23.00
Mixed borings, turnings	*26.00**
Short shovel turnings	*26.00**
Cast iron borings	*26.00**

Cast Iron Grades

No. 1 cupola	43.00
Chargings box cast	*38.00*
Stove plate	*29.00**
Burnt cast	*29.00**
Heavy breakable cast	37.00*
Unstripped motor blocks	30.00
Brake shoe	*29.00**
Clean auto cast	38.00
Drop broken machinery	48.00

Railroad Scrap

No. 1 R.R. heavy melt	*42.00*
Malleable	*45.00*
Rails, 18-in. and under	*53.00*
Rails, random lengths	*46.00*

*F.o.b. shipping point.

CHICAGO

No. 1 heavy melting	*35.00-37.00*
No. 2 heavy melting	*33.00-35.00*
No. 1 factory bundles	*37.00-39.00*
No. 1 dealer bundles	*35.00-37.00*
No. 2 bundles	*30.00-32.00*
No. 1 busheling	*35.00-37.00*
Machine shop turnings	*17.00-19.00*
Mixed borings, turnings	*17.00-19.00*
Short shovel turnings	*18.00-20.00*
Cast iron borings	*17.00-19.00*
Cut structurals	*44.00-45.00*
Electric furnace bundles	*44.00-45.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	*32.00-34.00*
Unstripped motor blocks	35.00-37.00
Clean auto cast	*42.00-44.00*
Drop broken machinery	*42.00-44.00*

Railroad Scrap

No. 1 R.R. heavy melt	*41.00-44.00*
R.R. Malleable	43.00-45.00
Rails, 2-ft. and under	*50.00-52.00*
Rails, 18-in. and under	*52.00-54.00*
Angles, splice bars	*47.00-49.00*
Rails, rerolling	*47.00-48.00*

BIRMINGHAM

No. 1 heavy melting	*29.50-30.50*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*29.50-30.50*
No. 2 bundles	*25.00-26.00*
Machine shop turnings	*20.75-21.75*
Short shovel turnings	*22.75-23.75*
Cast Iron borings	*22.75-23.75*
Cut structurals	*39.00-40.00*
Electric furnace bundles	*32.00-33.00*

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	*38.00-39.00*
Charging box cast	30.00-31.00
Stove plate	*34.00-35.00*
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	*35.00-36.00*
Rails, 2-ft. and under	*45.00-46.00*
Rails, random lengths	42.00-43.00
Angles, splice bars	*45.00-46.00*
Rails, rerolling	*45.00-46.00*

ST. LOUIS

(Brokers' Buying Prices)

No. 1 heavy melting	32.00
No. 2 heavy melting	32.00
No. 1 bundles	33.00
No. 2 bundles	30.00
Machine shop turnings	*18.00*
Short shovel turnings	*20.00*

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	34.00-35.00
Heavy breakable cast	30.00-32.00
Unstripped motor blocks	30.00-31.00
Brake shoes	41.00
Clean auto cast	44.00
Burnt cast	37.00-39.00

Railroad Scrap

Malleable	*36.00*
Rails, 18-inch and under	*53.00-54.00*
Rails, random lengths	39.00-40.00
Uncut tires	*44.00*
Angles, splice bars	47.00-48.00
Rails, rerolling	*45.00*

BUFFALO

No. 1 heavy melting	41.50-42.00
No. 2 heavy melting	39.00-39.50
No. 2 bundles	37.00-37.50
No. 1 bundles	42.00-43.00
No. 1 busheling	42.00-43.00
Machine shop turnings	24.50-25.00
Mixed borings, turnings	31.00-31.50
Short shovel turnings	32.00-32.50
Low phos.	43.50-44.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.50-41.50
No. 1 machinery	44.50-45.00

Railroad Scrap

Rails, random lengths	46.00-47.00
Rails, 2 ft. and under	52.00-53.00

BOSTON

(Brokers' Buying Prices; f.o.b. shipping points)

No. 1 heavy melting	32.00-32.50
No. 2 heavy melting	29.00
No. 1 bundles	32.00-32.50
No. 2 bundles	27.00
Machine shop turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings	23.00-24.00
No. 1 cast	34.00-35.00
Mixed cupola cast	32.00-33.00
No. 1 machinery cast	46.00-47.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting	33.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 2 bundles	26.00
No. 3 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Short shovel turnings	15.00
Electric furnace, No. 1	40.00-41.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	40.00
Heavy breakable cast	36.00-38.00
Unstripped motor blocks	29.00
No. 1 wheels	38.00-40.00

Railroad Scrap

Rails, random lengths	38.00

SAN FRANCISCO

No. 1 heavy melting	29.00
No. 2 heavy melting	25.00
No. 1 bundles	26.00
No. 2 bundles	23.00
No. 1 busheling	29.00
Machine shop turnings	11.00
Mixed borings, turnings	29.00
Short shovel turnings	29.00
Cast iron borings	29.00
Cut structurals	38.00
Heavy turnings	34.00
Punchings & plate scrap	37.50
Electric furnace bundles	37.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	47.00
Stove plate	46.00
Heavy breakable cast	45.00
Unstripped motor blocks	41.00
Brake shoes	41.00
Clean auto cast	52.00
No. 1 wheels	47.00
Burnt cast	41.00
Drop broken machinery	52.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Malleable	55.00
Rails, 3-ft. and under	42.00
Rails, 18-in. and under	45.00
Rails, random lengths	39.00
Cast steel	40.00
Uncut tires	39.00
Angles, splice bars	42.00
Rails, rerolling	44.00

LOS ANGELES

No. 1 heavy melting	30.00
No. 2 heavy melting	24.00
No. 1 bundles	29.00
No. 2 bundles	24.00
Machine shop turnings	12.00

Cast Iron Grades (F.o.b. Shipping Point)

No. 1 cupola	38.00-41.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	31.50
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	28.50
Rails, Remelting	35.50
Rails, Rerolling	38.50
Busheling	28.00
Busheling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	28.50

Cast Iron Grades

No. 1 Machinery Cast	50.00

† F.o.b., shipping point.

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Iron and Steel Scrap . . .

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	SEATTLE, WASH.	

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Scrap . . .

(*Continued from Page 173*)

mately 50 cents to $38. No. 2 bundles are nominally lower at $32. While there is no change in machine shop turnings at $27 to $28, mixed borings and turnings are easier at $32 and short shovel turnings at $33. Low phos structural and plate, heavy turnings and couplers, springs and wheels are steady. In the cast grades, charging box cast is nominally lower at $40 delivered, and heavy breakable at $43.

Washington—Consumption of scrap and pig iron during March totaled 12,409,000 gross tons, establishing a new high monthly record, reports the United States Bureau of Mines.

Purchased scrap use during the month was 3,211,000 gross tons, increase of 393,000 tons, over February, and a new high mark. Home scrap consumption was 3,325,000 gross tons, exceeding the record month of January by 130,000 tons. Pig iron consumption totaled 5,873,000 gross tons, increase of 666,000 tons over use in the preceding month, and 61,000 tons greater than the record month of October 1952.

Stocks of purchased scrap held by consumers totaled 4,751,000 gross tons at the end of March, drop of 95,000 tons from February but 1,274,000 gross tons more than on Mar. 31, 1952. Home scrap stocks amounted to 1,115,000 tons at the end of the month showing a decrease for the fifth consecutive month. Pig iron stocks totaled 1,691,000 tons, a slight increase over those at the end of February, and 93,000 tons more than at the end of March last year.

Cleveland—Absence of representative buying by the mills is reflected in continued easiness in the scrap market. Except for small lot movement from manufacturing plants direct to mills, largely turnings, the market is devoid of activity. The dealers are moving little tonnage and it is beginning to pile up in some yards. Actual level of prices is difficult to determine in the circumstances. For the most part quotations are unchanged but nominal at last week's level with No. 1 heavy melting around $39. However, several leading dealers think heavy melting should be quoted around $37 to $38 at present and think it may go still lower before buying revives.

Detroit—The sharp drop in scrap prices was followed last week with a less severe downward trend in turnings prices, heavy melting and cast iron grades. Some market observers feel that uncertainty for the future among dealers may have caused prices to drop lower than the supply-demand level justifies, while others think that the trend will continue downward slowly for some weeks to come until oversupply diminishes.

Chicago—Steel mills are buying sparingly in a scrap market which continues its sagging trend. Only a small part of May requirements has been contracted for but generous inventories permit coasting. Absence of representative purchases makes price determination difficult. With scrap in generous supply and seasonal factors favorable it seems unlikely that stable conditions will come until consumers achieve what is considered an economic price level. Prices are off $1 to $3 per ton over the past week.

St. Louis—Rail scrap prices have taken a sharp drop here in response to heavy offerings from railroads' spring maintenance work. Mill stockpiles, near 90 days, are holding up under plant-scrap returns, so there is unusual downward pressure on rail lists. Formerly mills were taking rail metal in order to depress melting steel quotas. One big consumer is accepting shipments on old orders slowly, and another is holding new purchases to one car per shipper for 10-days delivery.

Birmingham—Weakness continues in scrap here. Little demand for heavy melting grades is evident with most of the tonnage moving to other producing districts. Sluggishness also marks the cast grades. Declining prices have cut noticeably into scrap being brought into the district.

San Francisco—Despite the recent price declines, the market for steel scrap does not yet appear to have reached a leveling off point. Prices held unchanged last week, but the market tone is weak. Mills are getting large shipments and their inventories are comfortable.

Seattle—Turnover of scrap has declined because some large consumers are strikebound and others hold heavy stocks, particularly cast iron. Inventories generally are satisfactory.

April Steel Output Breaks Record for that Month

KEEPING PACE with the records set in preceding months of 1953, steel output in April reached 9,545,000 net tons of ingots and steel for castings, the highest ever attained in April. It was 19 per cent greater than in the same month of 1952.

Although a record, the total was below that of March, 1953, by 623,098 tons and represented only 98.7 per cent of capacity as against 101.8 per cent a month earlier. It also fell below the 100 per cent of capacity set in first quarter.

Several things account for the dropping off last month. Wildcat strikes on railroads serving the steel plants in Pittsburgh and Youngstown areas cost valuable tonnage in the first two weeks of the month. Also, the abandoning on Mar. 28 of the No. 3 open hearth shop at U. S. Steel Corp.'s Homestead Works, with its rated capacity of about 1 million tons a year, caused a dip in operations. Add to that the fact that April had one day less than March, and the reduced tonnage can be accounted for.

American Iron & Steel Institute says the record-high output of the first four months of this year exceeded the production of the corresponding part of 1952 by 3.3 million tons or 95 per cent. Part of the gain comes from increased capacity.

	OPEN-HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (net tons)	No. of weeks in mos.
	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity	Net tons	% of capacity		
1953										
January	8,841,679	101.4	350,200	88.9	706,083	81.2	9,897,962	99.1	2,234,303	4.43
February	7,939,299	100.8	329,389	92.6	664,091	84.6	8,932,779	99.1	2,233,195	4.00
March	9,050,773	103.7	354,710	90.0	762,615	87.7	10,168,098	101.8	2,295,282	4.43
1st Qtr.	25,831,751	102.0	1,034,299	90.4	2,132,789	84.5	28,998,839	100.0	2,254,964	12.86
†April	8,482,000	100.4	335,000	87.8	728,000	86.5	9,545,000	98.7	2,225,000	4.29
1952										
1st Qtr.	24,207,329	102.5	1,168,871	87.4	1,824,524	89.1	27,200,724	100.7	2,092,363	13.00
April	7,101,199	91.1	323,006	73.2	567,935	84.1	7,992,140	89.7	1,862,970	4.29

Note—The percentages of capacity in 1953 are calculated on weekly capacities of 1,969,275 net tons open-hearth, 88,934 net tons bessemer and 196,250 net tons electric ingots and steel for castings, total 2,254,459 net tons; based on annual capacities as of Jan. 1, 1953, as follows: Open-hearth 102,677,980 net tons, bessemer 4,637,000 net tons, electric 10,232,490 net tons, total 117,547,470 net tons. The percentages of capacity operated in 1952 are calculated on weekly capacities of 1,816,637 net tons open-hearth, 102,926 net tons bessemer and 157,477 net tons electric ingots and steel for castings, total 2,077,040 net tons; based on annual capacities as of Jan. 1, 1952, as follows: Open-hearth 94,973,780 net tons; bessemer 5,381,000 net tons; electric 8,232,890 net tons; total 108,587,670 net tons.

† Preliminary figures, subject to revision.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 171

Pittsburgh — Sagging foundry demand is reflected in an accumulation of coke. Also, some steel furnaces are down for repairs. Despite the

RAILROAD EQUIPMENT—FOR SALE

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STANDARD GAUGE FREIGHT CARS

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Eight Wheel, Cupola Type

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With background in steel and wire products, willing to relocate, to handle sales, correspondence and order department. Excellent opportunity to advance with growing organization. Give complete details on experience and qualifications—be specific, information will be held in confidence. Salary open. Write Box 723, STEEL, Penton Bldg., Cleveland 13, Ohio.

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MECHANICAL ENGINEER: Junior with practical experience bar mill, iron foundry and machine shop operation leading to executive position. Reply complete resume stating basic salary expected with added incentive compensation. Address Box 727, STEEL, Penton Bldg., Cleveland 13, Ohio.

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EXECUTIVE EXPERIENCED AS PLANT MANAGER with cost and production experience. Sound industrial background in administrative and management functions. 25 years' experience. B.S. Degree M.I.T. Write Box 693, STEEL, Penton Bldg., Cleveland 13, Ohio.

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SALES REPRESENTATIVE, METALLURGICAL ENGINEER, well established in Chicago area, with wide acquaintance in Chemical, Pharmaceutical, and Food Process Industries, desires additional account. Specialist in corrosion resistant metals. Write Box 709, STEEL, Penton Bldg., Cleveland 13, Ohio.

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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4300 tons, municipal hospital, Coney Island, New York City, through Gerace & Castagma, general contractors, to Harris Structural Steel Co., that city.

1700 tons, state bridge, York county, Pennsylvania, through G. A. & F. C. Wagman, Dallastown, Pa., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

360 tons, film plant, Eastman Kodak Co., Chamblee, Ga., to B. L. Montague Co., Sumter, S. C.; Henry C. Beck Co., Atlanta, Ga., general contractor.

725 tons, structurals and piling, bridge substructure, Sakonnet river, Portsmouth-Tiverton, R. I., to Bethlehem Steel Co., Bethlehem, Pa.; Whaling City Bridge & Dock Co., Groton, Conn., general contractor.

700 tons, Bensalem Township high school Bucks county, Pa., through B. Bornstein & Son, general contractors, Philadelphia, to Atlas Iron & Steel Co. and Manuel Greenberg, both of that city.

500 tons, building, the Evening Bulletin, Philadelphia, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

275 tons, Bedford District health center, Brooklyn, N. Y., to Schacht Steel Construction Inc., New York city.

130 tons, warehouse, Mercer Wholesale Drug Co., Mercer county, N. J., through Barclay White Co., Philadelphia, general contractor, to Robinson Steel Co., that city.

STRUCTURAL STEEL PENDING

5600 tons, state bridgework thruway, Oneida county, New York, Arthur A. Johnson and Peter Kiewett, New York, low on the general contract.

3500 tons, Fairchild Air Field, hangar, Washington state; bids in.

3000 tons, state thruway bridge, Monroe county, New York, Bates & Rogers, Chicago, low on general contract.

3000 tons, state hospital, Philadelphia, Turner Construction Co., low on general contract.

2400 tons, Major Deegan Expressway, contract No. 4, bids opened by the state May 28.

2100 tons, 77 items tower steel, bids to Bonneville Power Administration, Portland, Oreg., May 21.

2000 tons, 388 transmission towers; bids to Bonneville Power Administration, Portland, Oreg., May 14.

2000 tons, state thruway bridge work, Orange and Ulster counties, New York, John Areorio, Poughkeepsie, N. Y., low on general contract.

1100 tons, section, Major Deegan Expressway, Bronx county, New York, Charles A. Bachris Inc., Brooklyn, low on general contract.

500 tons, railway building, Pennsylvania railroad, Philadelphia, bids May 21.

415 tons, bridge, Philadelphia, bids to be closed by the Pennsylvania Highway & Bridge Authority June 5.

400 tons, training center, Big Delta, Alaska; general contract awarded Peter Kiewit Sons Co. and Fred J. Earley Jr. Co., San Francisco, joint low $12,243,078.

400 tons, power plant extension, Eielson Air Field, Alaska; Lytle & Green and S. Birch & Sons, Seattle, joint low $2,665,520.

300 tons, Logan Square shopping center, Norristown, Pa., bids closed May 15.

100 tons, 240-ft. Umatilla river bridge, Oregon; to West Coast Steel Works, Portland, Oreg., $62,101, subject to State Board of Control approval.

100 tons, Navy project, Kodiak, Alaska; general contract to Sam Bergersen, Tacoma, Wash.

100 tons, warehouse extension, Wyeth Laboratories, West Chester, Pa., bids closed May 11.

Unstated, two warehouses, Elmendorf Air Field, Alaska; general award to Morrison-Knudsen Co., Seattle, low $1,582,292.

Unstated, Ladd Field, Alaska, warehouse; general award to S. S. Mullen Inc., Seattle, low $450,139.

Unstated, aircraft maintenance shop, Eielson Field, Alaska; bids to U. S. Engineer, Seattle, May 29.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, steel highway paving fabric, state thruway, Montgomery county, New York, to Wickwire Spencer Division, Colorado Fuel & Iron Corp., New York; B. Perini & Sons, Inc., Framingham, Mass., general contractor; 1200 tons, bars, bridges, to Bethlehem Steel Co.

565 tons, bridge substructure, Sakonnet river, Portsmouth-Tiverton, R. I., to Plantations Steel Co., Providence; Whaling City Bridge & Dock Co., Groton, Conn., general contractor.

300 tons, dormitory, Tufts College, Medford, Mass., to Concrete Steel Co., Boston; John A. Volpe Construction Co., Malden, Mass., general contractor; fabricated structural steel to West End Iron Works, Cambridge, Mass.

270 tons, state thruway, sub. 5, Vloman Kill bridge, Albany county, New York, to Truscon Steel Division, Republic Steel Corp., South Boston, Mass.; Munroe-Langstroth, Inc., Norwood, Mass., general contractor; 300 tons, sheet and bearing piling to Bethlehem Steel Co., Bethlehem, Pa.

255 tons, high school building, Mansfield, Mass., to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.; White Construction Co., Boston, general contractor, fabricated structural steel to Builders Iron Works, Somerville, Mass.

160 tons, Wesley Gardens old peoples home, Zenith, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

Unstated, aircraft maintenance shop, Ladd Air Field, Alaska; bids to U. S. Engineer, Seattle, May 29.

Unstated, post headquarters and other buildings, Whittier, Alaska; bids to U. S. Engineer, Anchorage, Alaska, June 5.

Unstated, warehouse, Fairchild Air Base, Alaska; bids to U. S. Engineer, Seattle, about May 26.

Unstated, $250,000 office building, Vancouver, Wash., for P.U.D.; bids June 3.

Unstated, four highway viaducts in Benton, Douglas and Jackson counties, Oreg.; bids to the Highway Commission, Portland, Oreg., May 18.

Unstated, four highway spans, Curry and Grant counties, Oreg.; bids to Highway Commission, Portland, Oreg., May 19.

Unstated, highway bridge and railroad overpass, Flathead and Park counties, Mont.; bids to Helena, Mont., May 20.

Unstated, 5-story office building for United Pacific Insurance Co., Tacoma, Wash.; bids May 26.

PLATES . . .

PLATES PENDING

520 tons, high tensile steel hull plates; bids May 19, Corps of Engineers, Pittsburgh.

225 tons, Big Delta, Alaska, training center; general contract to Peter Kiewit Sons Co., and Fred J. Earley Jr. Co., joint low.

100 tons or more, tunnel shell, David W. Taylor model basin, Carderock, Md., Pittsburgh-Des Moines Steel Co., Pittsburgh, only bidder $1,525,000.

Unstated, 675 feet, 30-in. diameter, ¼-in. plate welded steel water pipe intertie; bids to Tacoma, Wash., May 11.

PIPE . . .

CAST IRON PIPE PLACED

100 tons, 12-in. water pipe and accessories, for Milwaukie, Oreg., to Hugh G. Purcell, Seattle, for U. S. Pipe & Foundry Co.

CAST IRON PIPE PENDING

250 tons, Lincoln Beach, Oreg., improvement; H. G. Purcell, Seattle, low $94,112 for cast iron; alternatives also under consideration.

150 tons, 8 and 4-in., also pump house and reservoir; bids to Hazel Clendenin, city clerk, Arco, Idaho, May 18.

RAILS, CARS . . .

RAILROAD CARS PLACED

Santa Fe, 500 seventy-ton drop-end mill-type gondola cars, to Pressed Steel Car Co.'s plant in Mt. Vernon, Ill.

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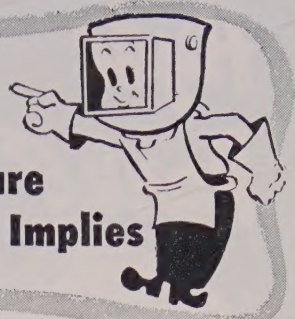

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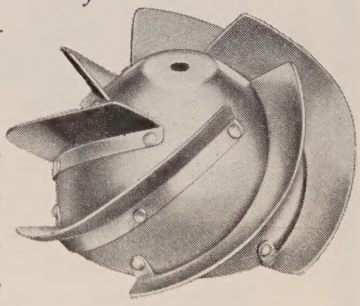

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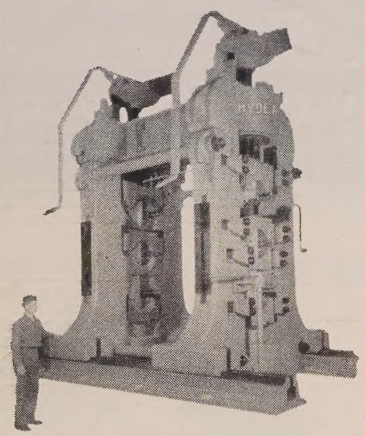

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FOUNDRY & MACHINE CO.
Hyde Park, Westmoreland County, Pa.

ROLLS
ROLLING MILL MACHINERY
GREY IRON CASTINGS

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WORM GEARING—Universal in its application—affords advantages for almost every power transmission job. Select worm gear units to meet your need from the complete Cleveland line.

Photo courtesy Engineering and Mining Journal.

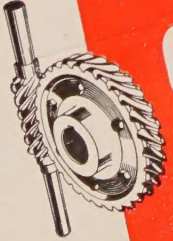
Easy picking on CLEVELAND-driven table

"Scalping off" lumps of impure metallic ore from this picking table is easier and more efficient because the belt moves evenly and without delays. It is kept running uniformly day in day out, year after year, by a Cleveland worm gear speed reducer.

Clevelands—designed for peak loads and top speeds—perform with sure, steady, even movement above or below ground, in all kinds of weather, under all operating conditions. For over a quarter century, Clevelands have faithfully served the mining industry—driving shuttle cars, picking tables, conveyors, hoists and other equipment on which a right-angle drive is needed.

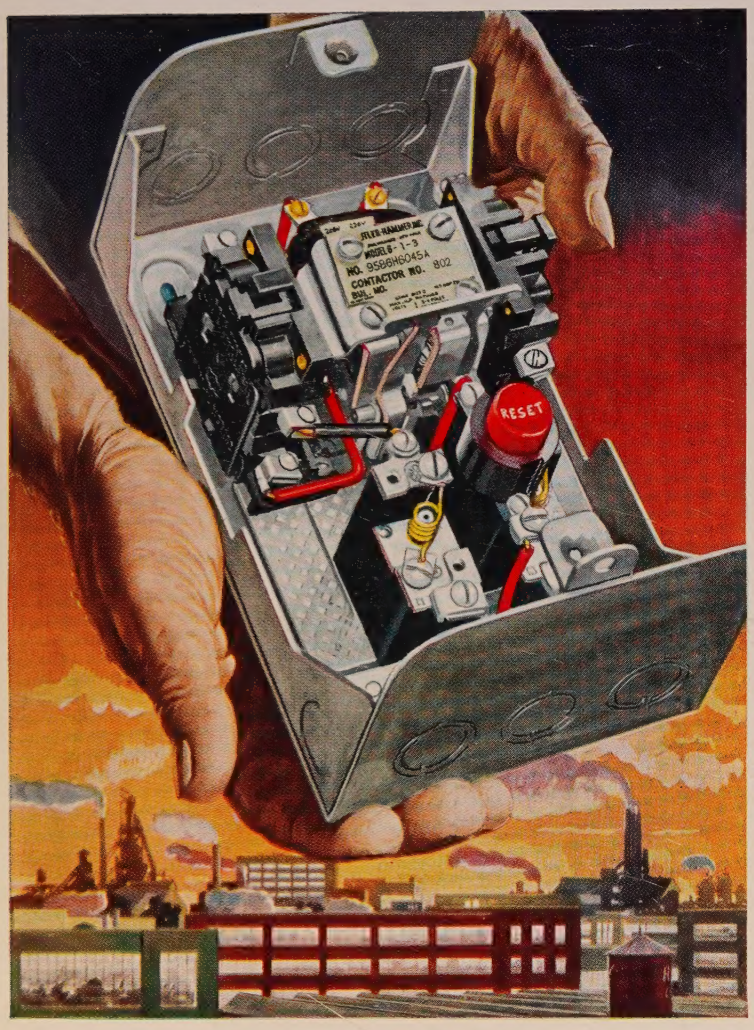
Clevelands are compact and powerful, have a minimum of moving parts, consequently, a greater freedom from repairs. If your plans call for a foolproof, trouble-free right-angle drive, investigate Cleveland. Write for new Catalog 400. The Cleveland Worm & Gear Company, 3270 East 80th St., Cleveland 4, Ohio.

Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.



CLEVELAND
Worm Gear
Speed Reducers

NEW CUTLER-HAMMER ☆☆☆ *motor control*



These 3 stars stand for 3 *NEW* standards in motor control . . .

☆ **INSTALLS EASIER**

☆ **WORKS BETTER**

☆ **LASTS LONGER**

The new Cutler-Hammer ☆☆☆ Motor Control is more than just an improved line. It is an engineering achievement. It offers a host of *new* motor control features. It definitely establishes entirely new standards in *all three* of the measures of motor control satisfaction and value.

★ First, it installs easier. This is not a mere detail; it is an important cost consideration. Factory records everywhere today show the cost of installing motor control is almost always greater than the cost of the equipment, often two or three times as much.

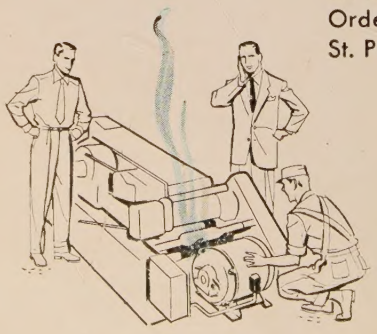
★ Second, it works better. It is quiet, smooth, completely dependable. New more accurate overload adjustment permits motors to be worked harder safely, with fewer nuisance interruptions.

★ Third, it lasts longer. Its remarkably longer life means it will outlive 90% of the machines or jobs it will be called upon to serve; *never* require maintenance care or cost on most jobs.

Know Cutler-Hammer ☆☆☆ Motor Control. Try it. Test it. Compare it. Prove it. Your nearby Authorized Cutler-Hammer Distributor is ready to serve you. Order from him today. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin.

Another CUTLER-HAMMER "*First*" . . . three-coil overload protection in standard motor control construction and enclosures.

Now the universally desired and widely demanded *full* three-phase overload protection, so necessary to prevent single-phasing motor burnouts, is here as an optional feature in standard starter constructions and enclosures. *Complete* three-phase motor protection . . . without the high cost of special starter assemblies and the many problems of stocking, handling and installing such special starters in their cumbersome off-size cases.



CUTLER-HAMMER
☆ ☆ ☆
MOTOR CONTROL
C-H